Vol. 906 Number 2

OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

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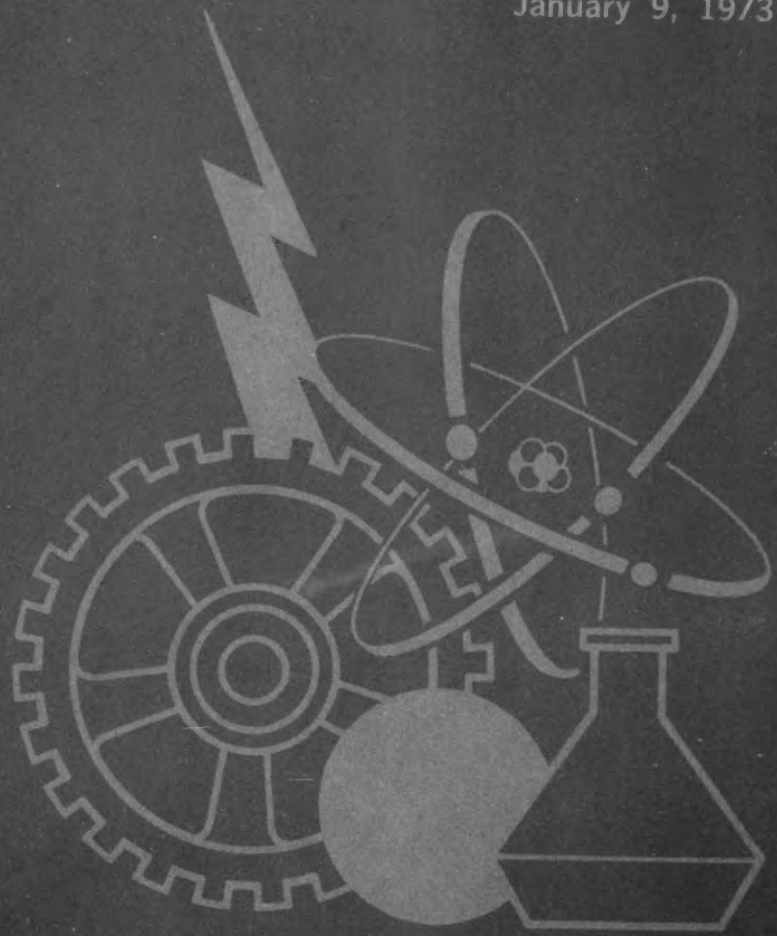
PATENTS

January 9, 1973



U. S. DEPARTMENT OF COMMERCE
Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

January 9, 1973 Volume 906 Number 2

CONTENTS

	Page
Patent Notices	
Patents Available for Licensing or Sale	366
Service by Publication	367
Annual Index of Patents	367
Condition of Patent Applications	368
Reissue Patents Granted	369
Plant Patents Granted	371
Patents Granted	
General and Mechanical	372
Chemical	585
Electrical	650
Design Patents Granted	751
Index of Patentees	PI 1
Indices of Reissues, Plants, and Designs	PI 49
Classification of	
Patents (Including Reissues)	PI 53
Designs and Plants	PI 56
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 57
Designs and Plants	PI 59

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $89.00 per annum, foreign mailing $22.25 additional; single copies $2.00 each.

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CIRCULARS OF GENERAL INFORMATION concerning PATENTS or TRADEMARKS, price 15 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Patents Available for Licensing or Sale

3,015,481. TUYERE ASSEMBLY. Archie H. Clingensmith, Box 502, Sharon, Pa., 16146.

3,165,853. FISH NET. Lacy C. Ansell, Box 1311, Chesapeake, Va., 23320.

3,570,507. ICE FISHING NET. Morris Kashuba, 1563 Main St., Peckville, Pa., 18452.

3,604,983. INSTANTANEOUS AND INVERSE-TIME-OVERCURRENT SENSOR. Automation Electric, 11204 Peach Grove St., North Hollywood, Calif., 91601.

3,627,299. SUCTION CLAMPING PLATE FOR THE GRIPPING OF THIN-WALLED WORK-PIECES. B. Schmiedeskamp, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,628,801. TOY ANIMAL TRICYCLE. Anne Lambrecht, Box 88, Ceylon, Saskatchewan, Canada.

3,685,825. BALLOON BURSTING GAME APPARATUS. Michael P. Dorazio, 48 George Drive, Vernon, Conn., 06068.

3,695,727. TRACTION ATTACHMENT FOR VEHICLES. J. Sesky, Chitina, Alaska, 99566.

3,697,127. PORTABLE SHAMPOO CHAIR. Aura M. Robertson, 1715 Park Ave., Red Bluff, Calif., 96080.

3,700,240. MISSILE THROWING APPARATUS HAVING CONNECTORS HOLDING TARGETS IN A GIVEN SPACED RELATIONSHIP. Juan San Emeterio, 23–31 37th St. Astoria, N.Y., 11105.

3,702,047. GLASS WALL CONSTRUCTION CONSISTING OF A PLURALITY OF GLASS ELEMENTS OF SUBSTANTIALLY U-SHAPED CROSS-SECTION. Siegfried Harcuba. Correspondence to: Werner W. Kleeman, Suite 212, Crystal Plaza 1, 2001 Jefferson Davis Highway, Arlington, Va., 22202.

The following 2 patents are offered by: Ralph L. Vierregger, 11664 Pierce St., Omaha, Nebr., 68144.

3,334,914. ANCHORING DEVICE FOR LADING STRAPS AND OTHER CARGO BINDING ELEMENTS.

3,572,223. LATERALLY-DISENGAGEABLE HIGHWAY MARKET ASSEMBLY.

General Motors Corporation is prepared to grant non-exclusive license under the following 4 patents upon reasonable terms.

Application for license may be addressed to: The Director, Patent Section, General Motors Building, 3044 W. Grand Blvd., Detroit, Mich., 48202.

3,527,544. COOLED BLADE SHROUD.

3,529,905. CELLULAR METAL AND SEAL.

3,532,006. SELECTIVE HYDROSTATIC AND HYDROMECHANICAL POWER TRAIN FOR PROPULSION AND STEERING.

3,534,635. POWER TRAIN.

General Electric Company is prepared to grant non-exclusive license under the following 22 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent may be addressed to: General Electric Company, Construction Materials Div., 1701 College St., Fort Wayne, Ind., 46804, Attention: Division Patent Counsel.

3,331,309. FRYING APPARATUS.

Applications for license under the following patent may be addressed to: Division Patent Counsel, Switchgear Equipment Business Div., General Electric Co., 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,441,698. VACUUM-TYPE CIRCUIT INTERRUPTER.

Applications for license under the following patent may be addressed to: General Electric Co., Division Patent Counsel, Houseware Business Div., 1285 Boston Ave., Bridgeport, Conn., 06602.

3,691,348. HEATING ELEMENT ASSEMBLY.

Applications for license under the following 4 patents may be addressed to: General Electric Co., Construction Materials Div., 1701 College St., Fort Wayne, Ind., 46804, Attn: Division Patent Counsel.

3,160,841. ADJUSTABLE SLIDING BRUSH TRANSFORMER.

3,160,842. ADJUSTABLE SLIDING BRUSH TRANSFORMER.

3,467,886. BALLAST APPARATUS FOR STARTING AND OPERATING ARC LAMPS.

3,676,739. MINE POWER SYSTEM GROUND CONTINUITY CHECK CIRCUIT.

Applications for license under the following 6 patents may be addressed to: General Electric Company, Patent Counsel, Re-entry and Environmental Systems Div., 3198 Chestnut St., Philadelphia, Pa., 19101.

3,321,828. ALUMINUM BRAZING.

3,322,517. ALUMINUM BRAZED ARTICLE.

3,373,482. FLUXLESS ALUMINUM BRAZING.

3,373,483. FLUXLESS ALUMINUM BRAZING.

3,378,914. FLUXLESS ALUMINUM BRAZING.

3,460,816. FLUXLESS ALUMINUM BRAZING FURNACE.

Applications for license under the following 8 patents may be addressed to: Patent Counsel, Ordnance Systems Department, General Electric Company, 100 Plastics Ave., Pittsfield, Mass., 01201.

3,277,714. SENSING DEVICE AND ARRANGEMENT.

3,303,811. METHOD AND APPARATUS FOR DRAG REDUCTION.

3,368,425. STEERING AND DRIVING POWER SYSTEM.

3,456,502. REENTRY SIMULATION.

3,489,036. HYDROMECHANICAL TRANSMISSION.

3,558,925. LOW RIPPLE DOUBLE DEMODULATOR.

3,646,399. PRINTED CIRCUIT BOARD CONSTRUCTION.

3,650,159. COMPOUND HYDROSTATIC TRANSMISSION.

Applications for license under the following 9 patents may be addressed to: Patent Counsel, Major Appliance Business Group, General Electric Co., Appliance Park, Louisville, Ky., 40225.

3,280,581. EVAPORATOR INCLUDING RADIANT HEATER DEFROST MEANS.

3,280,583. COMBINATION REFRIGERATOR.

3,531,824. COMBINATION DOOR HINGE AND STOP.

3,674,983. SMOOTH SURFACE ELECTRIC COOKTOP.

3,680,258. AIR CONDITIONER MOUNTING MEANS.

3,685,427. AIR-CONDITIONING AIR-DIRECTING MECHANISM.

3,686,477. MOUNTING SYSTEM FOR SOLID PLATE SURFACE HEATING UNITS.

3,690,120. STATIONARY MOLD ICE MAKER WITH THE BOTTOM EJECTOR.

3,691,937. COMBINED BROILER PAN AND BROIL RACK.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 55 patents.

Inquiries respecting licenses should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 1133 Avenue of The Americas, New York, N.Y., 10036.

3,695,554. NUTATION DAMPING IN DUAL-SPIN SPACECRAFT.

3,695,744. HOLOGRAPHIC MULTICOLOR TECHNIQUE.

3,695,956. METHOD FOR FORMING ISOLATED SEMICONDUCTOR DEVICES

3,695,960. FABRICATING RELATIVELY THICK CERAMIC ARTICLES.

3,696,250. SIGNAL TRANSFER SYSTEM FOR PANEL TYPE IMAGE SENSOR.

3,696,272. AVALANCHE DIODE.

3,697,178. METHOD OF PROJECTION PRINTING PHOTORESIST MASKING LAYERS, INCLUDING ELIMINATION OF SPURIOUS DIFFRACTION-ASSOCIATED PATTERNS FROM THE PRINT.

3,697,319. METHOD OF METALLIZING AN ELECTRICALLY INSULATING SURFACE.

3,697,336. METHOD OF MAKING SEMICONDUCTOR DEVICES.

3,697,686. CATHODE RAY TUBE IMPLOSION PROTECTION SYSTEM AND METHOD.

3,697,777. SIGNAL GENERATING CIRCUIT INCLUDING A PAIR OF CASCADE CONNECTED FIELD EFFECT TRANSISTORS.

3,697,794. PHOTOCATHODE COMPRISING LAYERS OF TIN OXIDE, ANTIMONY OXIDE, AND ANTIMONY.

3,697,800. HIGH VOLTAGE HOLD DOWN CIRCUIT.

3,697,817. MOUNTING ATTACHMENT FOR A MODULAR SUBSTRATE.

3,697,885. AUTOMATIC FREQUENCY CONTROL CIRCUITS.

3,697,909. DEFLECTION YOKE MOUNT.

3,698,000. FLEXIBLE AND SLIDABLE WAVEGUIDE FEED SYSTEM FOR A RADIATING HORN ANTENNA.

3,698,057. REVERSIBLE FIXTURE FOR POSITIONING MAGNETIC MEMORY CORES

3,698,449. FABRICATION OF LIQUID CRYSTAL DEVICES.

3,698,786. HIGH VOLTAGE PROCESSING OF CATHODE RAY TUBES.

3,698,794. SONIC PAGE COMPOSER FOR HOLOGRAPHIC MEMORY.

3,698,903. METHOD OF MAKING A GRADED PHOTOPRINTING MASTER.

3,699,257. AMPLIFIER CIRCUITS.

3,699,268. PHONOGRAPH PICKUP WITH SELF FORMED FEMALE RECEPTACLES.

3,899,335. APPARATUS FOR CHARGING A RECORDING ELEMENT WITH AN ELECTROSTATIC CHARGE OF A DESIRED AMPLITUDE.

3,699,355. GATE CIRCUIT.

3,699,395. SEMICONDUCTOR DEVICE INCLUDING FUSIBLE ELEMENTS.

3,699,400. AUTOMATIC DEGAUSSING APPARATUS FOR MINIMIZING RESIDUAL CURRENT DURING STEADY STATE OPERATION.

3,699,401. PHOTOEMISSIVE ELECTRON TUBE COMPRISING A THIN FILM TRANSMISSIVE SEMICONDUCTOR PHOTOCATHODE STRUCTURE.

3,699,403. FUSIBLE SEMICONDUCTOR DEVICE INCLUDING MEANS FOR REDUCING THE REQUIRED FUSING CURRENT.

3,699,404. NEGATIVE EFFECTIVE ELECTRON AFFINITY EMITTERS WITH DRIFT FIELDS USING DEEP ACCEPTOR DOPING.

3,699,476. CRYSTAL CONTROLLED DIGITAL LOGIC GATE OSCILLATOR.

3,699,529. COMMUNICATION AMONG COMPUTERS.

3,699,533. MEMORY SYSTEM INCLUDING BUFFER MEMORIES.

3,699,562. SAFETY APPARATUS FOR HOT-CHASSIS ELECTRONIC INSTRUMENTS.

3,700,152. WEB TRANSPORT APPARATUS.

3,700,497. METHOD OF MAKING A SEMICONDUCTOR DEVICE INCLUDING A POLYIMIDE RESIST FILM.

3,700,507. METHOD OF MAKING COMPLEMENTARY INSULATED GATE FIELD EFFECT TRANSISTORS.

3,700,791. CHARACTER GENERATOR UTILIZING A DISPLAY WITH PHOTOCHROMIC LAYER.

3,700,804. METHOD OF IMPROVING CATHODOCHROMIC SENSITIVITY.

3,700,958. DEFLECTION AND PINCUSHION CORRECTION CIRCUIT.

3,700,979. SCHOTTKY BARRIER DIODE AND METHOD OF MAKING THE SAME.

3,701,022. PEAK-TO-PEAK DETECTOR.

3,701,032. ELECTRONIC SIGNAL AMPLIFIER.

3,701,047. SEMICONDUCTOR LASER DEVICES UTILIZING LIGHT REFLECTIVE METALLIC LAYERS.

3,701,065. COLOR PICTURE TUBE BEAM CONVERGENCE APPARATUS.

3,701,107. COMPUTER WITH PROBABILITY MEANS TO TRANSFER PAGES FROM LARGE MEMORY TO FAST MEMORY.

3,701,185. METHOD OF ASSEMBLING A MASK WITH A FRAME ASSEMBLY FOR MOUNTING IN A CATHODE-RAY TUBE USING A REMOTE ASSEMBLY POSITION.

3,701,193. METHOD OF ASSEMBLING AND MOUNTING AN APERTURE MASK IN A MASK-PANEL ASSEMBLY OF A CATHODE-RAY TUBE USING A FULL SURFACE SPACER.

3,701,368. FABRICATION OF LIQUID CRYSTAL DEVICES.

3,701,674. APPARATUS AND METHOD FOR APPLYING A BEAD OF SEALING MATERIAL TO A SEALING SURFACE OF A CATHODE-RAY TUBE.

3,701,842. COLOR COMPENSATING NETWORK WITH RANGE LIMITATION.

3,701,844. COLOR COMPENSATING NETWORK FOR AN INTEGRATED CIRCUIT TELEVISION RECEIVER.

3,701,845. HUE CONTROL CIRCUIT FOR A COLOR TELEVISION RECEIVER.

3,701,984. MEMORY SUBSYSTEM ARRAY.

Patents Withdrawn from the Register

General Electric Company hereby withdraws the following 5 patents from the Register of Patents Available for Licensing or Sale. The patents were listed as being available in the OFFICIAL GAZETTE as indicated below:

3,118,795. METHOD OF FORMING FERROUS ALLOYS. Aug. 10, 1965.

3,132,022. METAL WHISKERS HAVING AN ESSENTIALLY CONSTANT DIAMETER OF NOT MORE THAN 1000 ANGSTROMS. July 21, 1970.

3,140,373. ARC IONIZABLE BERYLLIUM ELECTRODES FOR VACUUM ARC DEVICES. July 21, 1970.

3,188,182. USE OF THE WORKING MATERIAL AS PART OF THE CRYSTAL MAKING APPARATUS. July 21, 1970.

3,243,284. PROCESS FOR COLLECTING METAL WHISKERS. July 21, 1970.

Service by Publication

Jean Schieving

In accordance with Rule 47(b) of the Rules of Practice of the United States Patent Office in Patent Cases, notice is hereby given of the filing on September 3, 1969, of an application for patent entitled "Device for Determining the Transparency of the Atmosphere," on behalf of Jean Schieving, whose last known address is 5, Rue du Pape Carpentier, Paris 6eme, France. The application was made in compliance with Rule 47(b) and 35 U.S.C. 118 by Compagnie Des Compteurs without execution by the said Jean Schieving. Notice of the filing directed to the above noted address has been returned undelivered.

Any action to be taken by the said Jean Schieving in connection with the said application must be taken within thirty days of the publication of this notice.

RICHARD A. WAHL,

Dec. 18, 1972. *Assistant Commissioner of Patents.*

Annual Index of Patents

The 1971 edition of the Annual Index of Patents has been published. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

Price: Buckram bound, Part I, $24.75.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 12, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-18-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-07-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-03-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-30-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-03-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-19-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-13-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-03-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-09-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-29-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	4-27-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-13-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-07-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	11-16-71
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-03-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-04-71

Expiration of patents: The patents within the range of numbers indicated below expire during January 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,728,913 to 2,733,438, inclusive
Plant Patents..... Numbers 1,442 to 1,455, inclusive

REISSUES

JANUARY 9, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

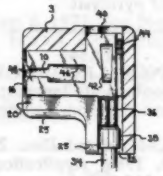
27,540
PANEL CONNECTOR WITH FLAG-TYPE TERMINALS

Robert John Kinkaid, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Original No. 3,075,167, dated Jan. 22, 1963, Ser. No. 38,022, June 22, 1960. Application for reissue May 7, 1971, Ser. No. 141,320

Int. Cl. H05k *1/07*

U.S. Cl. 339—176 MP 8 Claims



Multi-contact electrical connector comprises an insulating housing having a trough extending along one of its sides for reception of a PC board. A plurality of slots extend inwardly on the one side and a side adjacent to the one side. Flag-type contact terminals are removably positioned in the slots, the conductors secured to the terminals extending normally of the plane of the PC board when the edge of the board is positioned in the slot.

27,541
SILOXANE-OXYALKYLENE COPOLYMER FOAM STABILIZERS

Edward L. Morehouse, New City, N.Y., assignor to Union Carbide Corporation

No Drawing. Original No. 3,505,377, dated Apr. 7, 1970, Ser. No. 573,133, Aug. 12, 1966. Application for reissue No. 18, 1971, Ser. No. 200,242

Int. Cl. C07f *7/08*

U.S. Cl. 260—448.2 B 6 Claims

Compounds of the formula

$$Me_3SiO(Me_2SiO)_x(MeSiO)_ySiMe_3$$
$$\quad\quad\quad

tube of woven metal reinforced ceramic strand filled with ceramic fibers in bulk form on which the bottom of the inner cover rests.

27,544
PRODUCTION OF NETTING

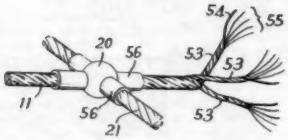
Anthony Bramley, Gosford House, Gosford, Kidlington, Oxford, England, and John Francis Gilbert, Chalford, Stroud, England; said Gilbert assignor to said Bramley

Original No. 3,501,366, dated Mar. 17, 1970, Ser. No. 458,591, May 25, 1965. Application for reissue Dec. 28, 1970, Ser. No. 102,276

Claims priority, application Great Britain, May 29, 1964, 22,379/64; Nov. 11, 1964, 45,987/64

Int. Cl. B32b *5/12, 3/10*

U.S. Cl. 161—57 **5 Claims**



A netting construction and a method of producing same wherein a first plurality of flexible threads of plastic material are positioned in spaced parallel relationship. A second plurality of spaced, parallel and flexible threads extend transversely across the first threads. A plurality of small masses of plastic material are individually molded about the intersections of the two pluralities of threads and welded to the plastic material of each thread. Portions of some of the longitudinal threads are preferably electrically conductive and have exposed conductive surfaces to permit the netting to be used for electrified fencing.

27,545
RANGE OPEN DOOR LATCHING DEVICE

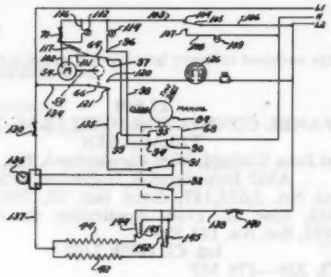
William R. Guy, Grand Rapids, Mich., assignor to Kelvinator, Inc., Cleveland, Ohio

Original No. 3,462,584, dated Aug. 19, 1969, Ser. No. 659,348, Aug. 9, 1967. Application for reissue Aug. 13, 1971, Ser. No. 171,481

Int. Cl. F27d *11/02*

U.S. Cl. 219—412 **10 Claims**

A latching device for a range oven door operated by an electric motor which also actuates circuit control switches of which one controls the motor and another the circuit to the oven heating elements for elevating the temperature in the range oven to effect a self cleaning thereof by the principle of pyrolysis.



27,546
CONCEALED HINGES

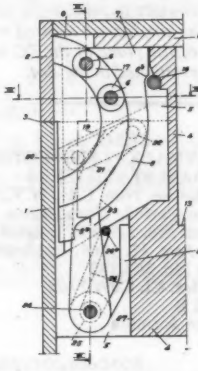
Robert R. Hocq, Boulogne-Billancourt, France, assignor to Societe Franco-Hispano-Americaine Francispam, Paris, France

Original No. 3,548,446, dated Dec. 22, 1970, Ser. No. 706,824, Feb. 20, 1968. Application for reissue July 15, 1971, Ser. No. 163,114

Claims priority, application France, Feb. 24, 1967, 96,374; Jan. 30, 1968, 137,917

Int. Cl. E05d *3/06*

U.S. Cl. 16—164 **6 Claims**



A concealed hinge for a container such as a box or case, particularly for a small case such as that of a cigarette lighter, the hinge having two main component parts, one provided with arcuate grooves which each cooperate with rollers in the other component part. A spring coupling may be provided to hold the hinge stable in the fully open and fully closed positions.

PLANT PATENTS

GRANTED JANUARY 9, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,286

STRAWBERRY PLANT

Harold A. Johnson, Jr., Watsonville, Calif., assignor to Driscoll Strawberry Associates, Inc., Watsonville, Calif.

Filed Apr. 8, 1971, Ser. No. 132,620
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

3,287

ROSE PLANT

Robert G. Jelly, Richmond, Ind., assignor to E. G. Hill Co., Inc., Richmond, Ind.

Filed Apr. 9, 1971, Ser. No. 132,919
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—20 **1 Claim**

A brilliant red greenhouse rose developed for improved year-around cut flower production by crossing "Forever Yours" (P.P. #2443) with an undisseminated and unpatented red seedling, the new variety being distinguished by its improved flower color and superior flower form, its abundant and continuous production of large many petaled blooms, and its excellent winter performance with a reduced number of blind shoots.

3,288

CHRYSANTHEMUM PLANT

Bob G. Coward, Fort Myers, Fla., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 26, 1971, Ser. No. 119,422
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the parent cultivar Yellow Marble by its approximately one-quarter inch larger flowers, darker yellow flower color with less oxidation of color as flowers mature, fewer green bracts in center of flower in high temperature periods, and approximately two inch more vigor, and characterized as to uniqueness when compared to the cultivar Gold Marble by its flowers which are lighter yellow in color and approximately one-half to three-quarters of an inch larger, approximately eight to ten inches more vigor and three to four fewer flowers per stem, its more vegetative or less reproductive selection which produces a more terminal, less compound spray formation, and its approximately 2–3 later response in spring and 2–3 days earlier response in fall.

3,289

CHRYSANTHEMUM PLANT

Eugene T. Gentile, Reading, Mass., and Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Dec. 14, 1970, Ser. No. 98,217
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—80 **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the cultivar Mefo by its ½" smaller flower with better form retention, much darker pink color when flowered under the lower light, lower temperature conditions of late fall through early spring when night temperatures do not exceed 60° F. and/or day temperatures seldom go above 68–70° F., 3" less vigor, slightly smaller foliage, and 3–5 days later response.

3,290

KALANCHOE PLANT

James T. Irwin, Canyon, Tex., assignor to Irwin Greenhouses, Inc., Canyon, Tex.

Filed Apr. 13, 1971, Ser. No. 133,768
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of kalanchoe plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a compact but upright and medium tall habit of growth, attractive glossy dark green foliage of medium to small size which accentuates the attractiveness of the flower heads and contributes to good shipping qualities, a compact and clean-cut flower form, with the flower petals being decidedly notched at their tips and having an obtuse form, a distinctive and attractive rose pink flower color which is uniquely different from other kalanchoe varieties, and an ability to be brought into bloom all year around by appropriately adjusting the photoperiod.

PATENTS

GRANTED JANUARY 9, 1973

GENERAL AND MECHANICAL

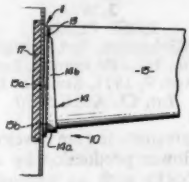
3,708,799
SEAT PROTECTIVE GARMENT
Charles D. Smithdeal, c/o Ponce de Leon Eye, etc., Infirmary, 144 Ponce de Leon Avenue, N.E., Atlanta, Ga.
Filed March 12, 1971, Ser. No. 123,604
Int. Cl. A41d *27/12*
U.S. Cl. 2—46 **1 Claim**

A seat protective garment made from sheet plastic film, rubber coated nylon fabric and like material in a general configuration to fit on the waist of the wearer and extend below the seat around a portion of the back of each leg. A simple tie string at the top and tie strings for each bottom leg portion hold the garment in place over the seat of the wearer. The protective garment may be left in place on the waist and rolled up at the back when not in use or incorporated as part of the inner flap of the lining of a coat or parka, and may be used to protect the seat from moisture when sitting and ascending on a ski lift.

3,708,800
GOWN CONSTRUCTION
Geraldine E. Burton, 1530 Hubbard Avenue, Salt Lake City, Utah
Filed Jan. 21, 1971, Ser. No. 108,342
Int. Cl. A41d *1/22*
U.S. Cl. 2—74 **12 Claims**

A gown design or construction intended to minimize, if not eliminate, alterations of individual items and reduce ranges of stock sizes for stores, rental establishments and so forth. The present design comprises a gown which is vertically adjustable as to skirt length by means of inclusion of adjustable shoulder straps. The gown includes an empire waist so that material may flow loosely over the hipline, and is provided with a top the back of which is adjustable in a transverse dimension. By such design, a minimum number of tops and gowns may be provided to accommodate a wide range of sizes, such as ladies with odd, even, and even half-sizes.

3,708,801
GUN BUTT LOCATOR
Marvin A. Davis, 66 Ocean View, Apt. 33, Santa Barbara, Calif.
Filed March 4, 1971, Ser. No. 121,057
Int. Cl. A41d *1/00*
U.S. Cl. 2—94 **8 Claims**

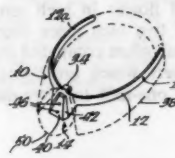


A gun butt locator comprises

a. a relatively thin pad adapted to be attached to a shooting jacket with the pad oriented generally upright and

b. an upright generally U-shaped holder integrally carried by the pad so as to project at the front thereof to downwardly and rearwardly seat a generally vertical gun butt with the butt rear face engaging the pad and the butt lower portion seated in the holder.

3,708,802
NECKWEAR SUPPORT STRUCTURE
Franklin J. Seibert, Westmont, Ill., assignor to Ja-Dor Inc.
Filed Sept. 14, 1970, Ser. No. 71,737
Int. Cl. A41d *25/16*
U.S. Cl. 2—155 **7 Claims**



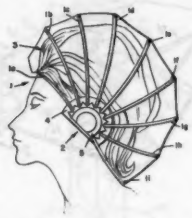
A neckwear support structure comprising a resilient band defining an arc of more then 180° having an upper edge located in a plane. The outer wall of the neckwear support structure is substantially perpendicular to the upper edge plane adjacent the free ends of the band, and defines a progressively decreasing angle with the upper edge plane at locations spaced from the free ends. The support structure further includes hook means connected to the upper edge intermediate the ends of the structure, and neckwear support means on the band located equidistant from said ends and defining a flat surface spaced from the outer wall.

3,708,803

COLLAPSIBLE COIFFURE COVERING

Miriam M. Teaff, 3133 Volk Street, Long Beach, Calif.

Filed July 22, 1970, Ser. No. 57,181
Int. Cl. A42b 1/06
U.S. Cl. 2—198 5 Claims



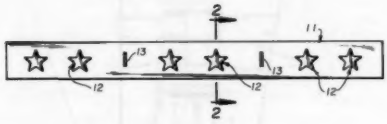
A hairdo covering structure to fit over and protect a woman's coiffure without disturbing same, the structure having a plurality of lightweight and elastic curved frame members rotatively attached at their respective ends to allow the frame members to be collapsed or expanded to provide spacing between the respective central portions thereof. A thin sheet of covering material is attached to the outer surface of the frame members to provide the desired wind and moisture protection when the structure is supported and held for the user's head by at least the elasticity of the structure between the rotatively mounted ends of the frame members.

3,708,804

DECORATIVE GARMENT ACCESSORY

Manuel V. Santos, 115 Ferry Street, Newark, N.J.

Filed June 25, 1970, Ser. No. 49,675
Int. Cl. A41d 27/08
U.S. Cl. 2—244 9 Claims



A decorative garment accessory which may take any number of different forms such as a belt, an accessory attachment for a belt, a shirt or blouse dickey, a sleeve, hem or other border finishing accessory or the like comprising an elongated, relatively narrow mounting strip having a plurality of spaced apart, generally parallel slots oriented generally transverse to the longitudinal axis of the strip, and decorative elements detachably attached to the strip by means of a staple formed on the back of each decorative element projecting through the slots in the mounting strip and an elongated retainer passing through the staples on the side of the strip opposite the decorative elements.

3,708,805

PROSTHETIC ELBOW JOINT

John Tracey Scales, Stanmore, and David Goddar, King's Langley, both of England, assignors to National Research Development Corp., London, England

Filed Dec. 21, 1970, Ser. No. 100,118
Claims priority, application Great Britain, Dec. 24, 1969, 62,905/69
Int. Cl. A61f 1/24
U.S. Cl. 3—1 13 Claims

A prosthetic elbow joint device comprises a humeral member, an ulnar member and a connecting piece to connect the humeral and ulnar members in a working relationship allowing hinging movement of the one relative to the other, the connecting piece and one of said members being formed to permit attachment of the connecting piece and said member in a working relationship allowing hinging movement between them, and the connecting piece and the other of said members being formed to permit attachment of the connecting piece

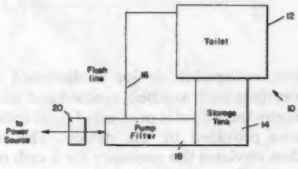
and said other member in a substantially rigid fashion, thereby allowing assembly of the hinge joint of the device prior to insertion of the device into the patient, and location of the device on insertion so that the axis of the hinge joint lies through the epicondyles in a position conforming substantially with that in the natural elbow joint.

3,708,806

FILTER AND PUMP FOR A RECIRCULATING SANITARY SYSTEM

James M. Kemper, Hollywood, Calif., assignor to Monogram Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 829,486, June 2, 1969, Pat. No. 3,567,032, which is a continuation-in-part of Ser. No. 737,232, June 14, 1968, abandoned. This application Nov. 13, 1970, Ser. No. 89,385
Int. Cl. B01d 29/38
U.S. Cl. 4—10 22 Claims



In a recirculating sanitary system, an improved filter and pump assembly provides a source of flushing liquid. A diaphragm pump is provided with a coupling to a plurality of needle members that reciprocate through an apertured plate. The needle members extend beyond the plate into the storage tank at all times, and the reciprocating motion imparted to the needle members tends to clean the needle-aperture combination, which acts as the filter. The pump also supplies a limited back flow through the filter for cleaning purposes during a portion of the operating cycle.

3,708,807

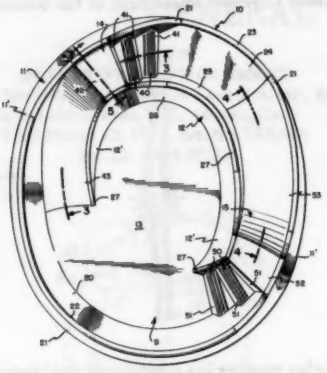
SLIDE-IN, SLIDE-OUT PLAY POOL

Ascher Chase, Norfolk, Va., assignor to General Foam Plastics Corp., Norfolk, Va.

Filed July 2, 1971, Ser. No. 159,396
Int. Cl. E04h 3/16, 3/18
U.S. Cl. 4—172 7 Claims

A molded tub or play pool structure having a pair of integrally molded recreational structures including sliding sur-

faces and steps leading up to the sliding surfaces is disclosed herein. The recreational structures in cooperation with two U-shaped end walls define a water-retaining pool. More specifically, the sliding surfaces are oppositely oriented, one of the sliding surfaces permitting sliding entry into the pool, the other sliding surface permitting sliding egress from the pool.



3,708,808

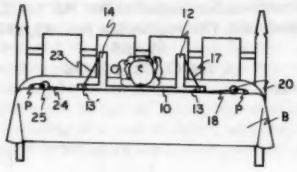
INFANT RESTRAINER

James E. Irby, Route 3, Box 145, Spartanburg, S.C.

Filed March 30, 1971, Ser. No. 129,525

Int. Cl. A47d 7/04

U.S. Cl. 5—95 **14 Claims**



A portable, collapsible device is disclosed that may be placed on a surface such as a bed, erected and an infant placed therein whereby the infant is precluded from rolling out of the confined area provided by the device. The instant infant restrainer thus obviates the necessity for a crib or the like for the very small infant and generally comprises a base which may or may not be padded, side walls associated with the base which when erected at opposite sides of the base provide barriers against movement by the infant. Collapsibility of the device requires means for holding the walls in the erected position when desired. As such, certain means are disclosed for use in erecting the side walls, holding the side walls in the erected position and optionally being attachable to a surface such as a bed so as to immobilize the entire device. The device may also be adapted for use in an automobile where a seat belt may be used to secure the device to an automobile seat.

3,708,809

EDGE SUPPORT FOR A SPRING UNIT

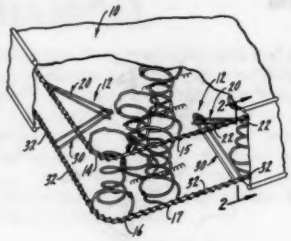
Ernest L. Basner, Littleton, Colo., assignor to Sealy, Inc., Chicago, Ill.

Filed March 23, 1971, Ser. No. 127,115

Int. Cl. A47c 23/04

U.S. Cl. 5—260 **14 Claims**

An improved edge support for a spring unit wherein a plurality of edge supports are situated along the edges of the spring unit and are each comprised of a pair of wire members that have a supporting position and a non-supporting position. The wire members are initially disengaged in the non-supporting position to allow the spring unit to be baled. The wire members can be readily interlocked to establish a supporting position where each of the wire members operates as a lever bending about a fulcrum and thus reinforces and stiffens the edges of the spring unit.



3,708,810

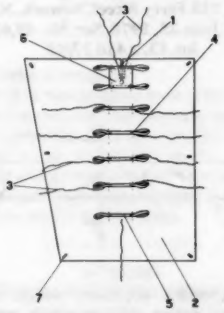
PROTECTIVE BLANKET

Pauli Assar Antero Merikallio, Iso-Robertinkatu 29-31 A7, Helsinki, Finland

Filed Oct. 6, 1970, Ser. No. 78,387

Int. Cl. A61j 7/10, 9/00

U.S. Cl. 5—343 **3 Claims**



A protective blanket is made from a fabric of thin and flexible material impermeable to wind and moisture, one of the surfaces of the fabric being metallically glossy and thus reflective for thermal radiation, the outer surface of the fabric carrying transverse supporting straps fixed at a distance from each other and having loops at their ends. Thus, two rows of loops are formed through which supporting rods can be extended.

3,708,811

SINGLE ANCHOR LEG SINGLE POINT MOORING SYSTEM

John F. Flory, Morristown, N.J., assignor to Esso Research and Engineering Company

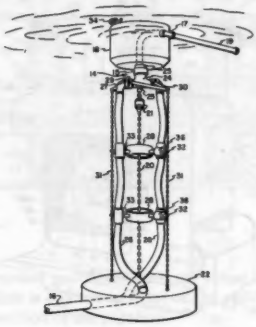
Continuation-in-part of Ser. No. 856,261, Sept. 9, 1969. This application Jan. 6, 1971, Ser. No. 104,208

Int. Cl. D06p 3/00

U.S. Cl. 9—8 P **23 Claims**

A single anchor leg single point mooring and cargo handling system for seagoing ships is provided which comprises a mooring buoy anchored to a mooring foundation by anchor means such as a chain having little or no slack or an articulated rigid member (e.g. pipe, solid bar, etc.), cargo handling facilities

extending between the mooring foundation and the mooring buoy, or alternatively directly between the mooring foundation and the ship to be loaded or unloaded, means for permitting the buoy to freely rotate, and restraint means for preventing entanglement of the cargo handling facilities and the anchor chain.



3,708,812

EQUIPMENT HOUSING FOR SUBMARINE SUSPENSION

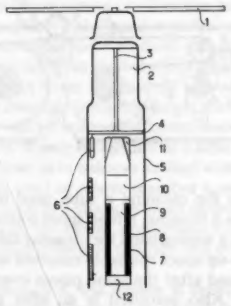
Claude Yapoudjian, Chilly-Mazarin, and Max Henelle, Cachan, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed June 29, 1971, Ser. No. 157,832

Claims priority, application France, June 29, 1970, 7024008

Int. Cl. B63b *21/52*

U.S. Cl. 9—8 R **10 Claims**



An equipment housing for submarine suspension from a buoy designed to be dropped vertically into water with the housing mounted therein so that the impact with the water frees the housing to hang below the buoy on a cable at a predetermined depth selected by one of a plurality of cords connecting the housing to respective spaced points on the cable, a selector being provided for initially cutting all but one cord to select said predetermined depth.

3,708,813

METHOD AND APPARATUS FOR MAKING BOOKS INCLUDING A BOOK BLOCK BONDED TO A BOOK COVER BOARD STRUCTURE

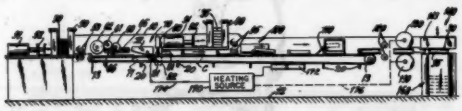
Leewood C. Carter, Warren Twsp.; Edward K. Mullen, Westfield, and Anthony J. Davanzo, Essex Fells, all of N.J., assignors to Book Covers, Inc., Newark, N.J.

Filed Feb. 22, 1971, Ser. No. 117,578

Int. Cl. B42c *11/00, 5/02*

U.S. Cl. 11—3 **13 Claims**

A method and apparatus for making books including a book block bonded to a book cover board structure includes a continuous conveyor onto which is placed a linear array of book cover board structures. Each structure includes two leaf boards which are hinged together, and the board structure is disposed in a horizontal open position to enable the application of adhesive material to the upper surface of the board structure. The structure is then pre-bent about the hinged portion, after which additional adhesive is applied to the hinged portion of the board structure. At the next stage in the operation, a book block is placed on one leaf portion of the board structure, after which the other leaf portion is folded so as to cover the book block. The final step in the process is the bonding of the board structure to the book block.



3,708,814

HEEL SEAT MOLDING AND LASTING MACHINES

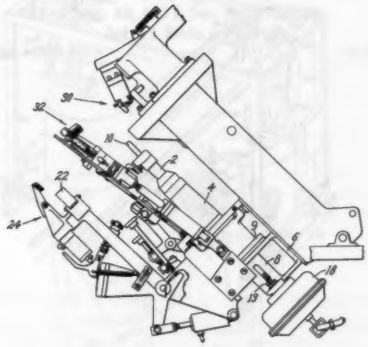
George C. Barton, 126 Spencefield Lane, Leicester, England

Filed Nov. 24, 1970, Ser. No. 92,358

Claims priority, application Great Britain, Nov. 29, 1969, 58,451

Int. Cl. A43d *21/00*

U.S. Cl. 12—12.5 **4 Claims**



A shoe upper conforming machine having at last support including a jack post slidable in a direction substantially normal to the operating plane of a pair of heel seat wipers and fluid pressure means in the jack post for positioning the bottom of a last on the support at a predetermined level relative to said operating plane regardless of the height of the last prior to the lasting operation.

3,708,815

METHOD OF MANUFACTURING WATERPROOF SHOES

Jaromir Jurasek; Mojmir Mikac, and Karel Podzimek, all of Gottwaldov, Czechoslovakia, assignors to Svit, Narodni Podnik, Gottwaldov, Czechoslovakia

Filed Feb. 12, 1971, Ser. No. 114,828

Int. Cl. A43d *9/00*

U.S. Cl. 12—142 E **4 Claims**

A method of manufacturing waterproof shoes wherein an exterior upper body including sides and sole is molded in one

piece. The sole is removed leaving a marginal strip. A lining made in a unitary body having sides and sole is inserted in the

exterior body. A bottom is thereafter applied to the marginal strip.

3,708,816

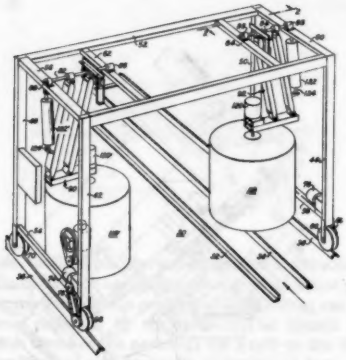
VEHICLE WASHING APPARATUS

Angelo Napoli, 1609 Wills Place, Vineland, N.J.

Filed Sept. 9, 1970, Ser. No. 70,851

Int. Cl. B60s *3/06*

U.S. Cl. 15—21 E **4 Claims**



Vehicle washing apparatus including a frame upon which is mounted a pair of opposing side brush assemblies each having a vertically oriented side brush hung from the free end of a parallelogram linkage assembly which is pivotally suspended from an overhead shaft so as to permit controlled pivotal movement transversely of the frame as well as damped, spring-cushioned pivotal movement longitudinally of the frame whereby the front, rear and side areas of a vehicle may be efficiently washed.

3,708,817

BUFFING AND DEBURRING MACHINE

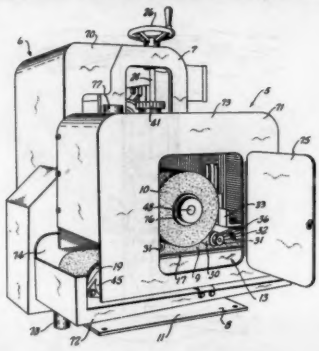
Wallace R. Rhine, Stillwater, and Fred W. Kiser, Hopkins, both of Minn., assignors to Timesavers, Inc., Minneapolis, Minn.

Filed March 24, 1971, Ser. No. 127,669

Int. Cl. A46b *13/04*

U.S. Cl. 15—77 **9 Claims**

A rotary brush mounted on a power driven spindle which in turn is journaled in a bearing unit that is supported for axial oscillation by a pair of leaf springs, has work fed to it by an



endless conveyor located beneath the brush. The bearing unit is axially oscillated by a power driven eccentric.

3,708,818

APPARATUS FOR CLEANING TUBES AND THE LIKE

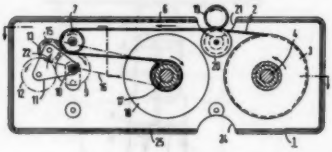
Karl Hotz, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Nov. 18, 1970, Ser. No. 90,671

Claims priority, application Germany, Nov. 26, 1969, P 69 45 822.6

Int. Cl. G21f *9/34*

U.S. Cl. 15—97 **3 Claims**



An apparatus for cleaning a tube used to accommodate reactor fuels has a housing, a feed spool rotatably mounted in the housing and a wiping band for cleaning the tube. Also provided are a take-up spool rotatably mounted in the housing for receiving the band after the same passes over and in contact with the tube. Also provided is an idler pulley rotatably mounted in the housing away from the feed spool to direct the wiping band parallel to a side of the housing and to reverse the direction of travel of the band before the latter is received by the take-up spool. A drive mechanism connected to the take-up spool rotates the latter to take up the wiping band. The housing has an opening through which the tube is insertable into the housing. The housing also has a breakout to provide an opening through which a sensor is insertable for measuring the contamination on the wiping band after the latter passes over the tube.

3,708,819

APPARATUS FOR DRYING PIPELINES

Michael P. Breston, 3643 Tartan, Houston, Tex.

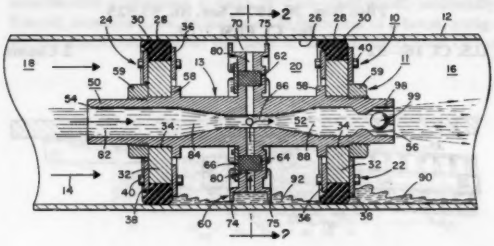
Filed June 5, 1970, Ser. No. 43,675

Int. Cl. B08b *9/04*

U.S. Cl. 15—104.06 R **7 Claims**

An apparatus capable of being propelled by a gas through a pipeline for drying the pipeline. The apparatus comprises a pipeline pig combined with a liquid pumping device. A portion of the propelling gas enters the pumping device which includes means to increase the velocity and decrease the pres-

sure of the admitted gas. This pressure decrease is used to dynamically lift any liquid which may enter the pumping



device. The motive gas mixes with the lifted liquid to form a fine spray which is ejected in front of the moving pig into the downstream section of the pipeline.

3,708,820

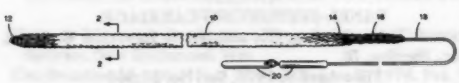
GUN CLEANING AND PROTECTING DEVICE

Wesley J. Schultea, 67 Burress St., Houston, Tex.

Filed Feb. 22, 1971, Ser. No. 117,298

Int. Cl. B08b 9/02

U.S. Cl. 15—104.16 **2 Claims**



The device in itself is an elongated cord, sleeve or hollow rope of absorbent fibers woven or otherwise joined together to form a generally cylindrical shaped member in a length about as long as the gun barrel to be cleaned and oiled. One end of the member protrudes from the bore into the chamber and the other end protrudes from the muzzle end of the barrel. In cross section the member is slightly larger than the bore of the barrel so that it will be somewhat compressed as it is pulled through the barrel. It may be as solid as a rope or cord, or may be somewhat hollow, as in a sleeve knitted with string.

One end of this cord or sleeve member is secured to a connecting member such as a string or small diameter cable which is at least as long as the barrel, and, where necessary, a small diameter weight is attached to the free end of the connecting member.

For cleaning purposes, the weight is dropped through the barrel or the connecting member is pushed through from one end to the other, preferably from chamber to muzzle, and is then used to pull the cleaning device through the barrel. When the user of the device is satisfied that his barrel is clean, he uses the identical device or a duplicate for continuous lubrication by running it into the barrel and leaving it there with a portion protruding from at least the chamber end. Oil may be added as needed, and the portion of the sleeve in the chamber serves as a safety device in the event any attempt is made to fire the weapon without withdrawing the sleeve.

3,708,821

PAINT EDGER

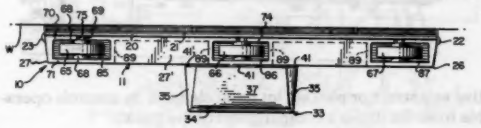
David O. Chase; Martin V. Maloney, both of Skaneateles; Frederick J. Wood, Jr., Lancaster, and Barry B. Wood, Williamsville, all of N.Y., assignors to Shur-Line Manufacturing Co., Inc., Lancaster, N.Y.

Filed Jan. 26, 1971, Ser. No. 109,905

Int. Cl. A46b 11/00

U.S. Cl. 15—210 R **16 Claims**

A paint edger for edging paint applied to one of two surfaces such as a wall and ceiling which form an inside angle including a frame plate having a front surface and a rear surface, a handle extending outwardly from the rear surface and including a key selectively insertable into the handle for permitting it to pivot relative to the frame plate or for locking it relative to the frame plate, a spring connecting the handle and the frame plate for biasing the handle to a central position when it is mounted for pivotal movement, a backing plate selectively mountable on the front surface of the frame plate by means of a sliding fit which includes channel flanges on end



of the backing plate for engaging inclined side edges of the rear surface of the frame plate, which when engaged with an interference fit by the channel flanges cause the central portion of the backing plate to fit snugly against the front surface of the frame plate, an absorbent pad adhesively secured to the backing plate and a plurality of rollers at the upper edge of the frame plate for engaging one of the two adjacent surfaces which form the inside angle for guiding the paint edger along the other surface.

3,708,822

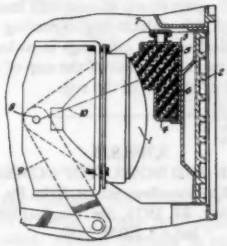
HEADLAMP CLEANER

Robert M. Buchwald, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 18, 1971, Ser. No. 172,734

Int. Cl. B60s 1/02

U.S. Cl. 15—250.03 **4 Claims**



A vehicle headlamp washer is provided for concealed headlamps wherein the cover for the lamps provides a container for a sponge or similar material and as the cover is moved to expose the headlamp, the sponge wipes across the lamp to clean it.

3,708,823

STREET AND PARKING LOT CLEANER ATTACHMENT FOR VEHICLES

Berl L. Bell, 1196 N. Neff Street, Canby, Oreg.

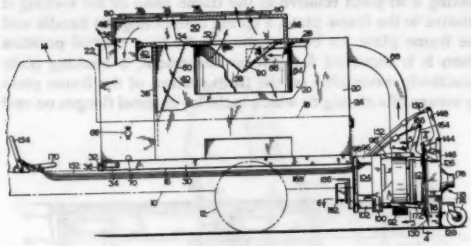
Filed March 3, 1969, Ser. No. 803,625

Int. Cl. A47l 9/00

U.S. Cl. 15—340 **3 Claims**

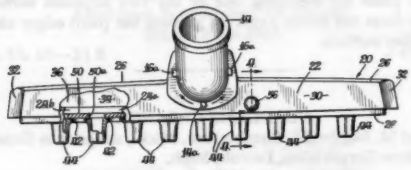
The bed of a pickup truck supports a refuse container having an inlet conduit from the outlet of a suction fan mounted rearward of the container. The screened air outlet of the container includes a scrubbing chamber adapted to contain water

for removing dust from the exhaust air. The fan inlet communicates with a suction head which is vertically adjustable rela-



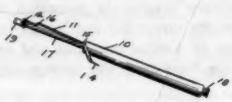
tive to a street or parking lot to be cleaned, by controls operable from the driver's compartment of the truck.

3,708,824
SUCTION-CLEANING IMPLEMENT
Siegmund B. Holubinka, 1022 North Main St., Naperville, Ill.
Filed Jan. 22, 1971, Ser. No. 108,895
Int. Cl. A47l *9/02*
U.S. Cl. 15—397 **7 Claims**



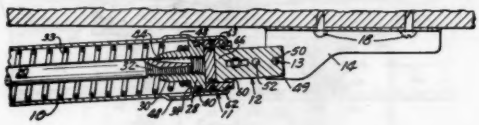
A pneumatic suction-cleaning implement for use with a vacuum cleaner on rugs, and the like, comprising a suction nozzle structure having wall means movable over a surface to be cleaned. Means is provided defining first and second nozzle openings on spaced-apart levels in said wall means, and valve means is provided for selectively directing suction flow between said first and second openings in order to clean at a lower level deep-down at the base of the nap of a high-pile rug or at an upper level on the top of the rug.

3,708,825
DOOR CHECK AND DOOR STOP COMBINATION
Robert J. Wood, 3938 Sassafras Street, Erie, Pa.
Filed Nov. 24, 1971, Ser. No. 201,866
Int. Cl. E05f *3/00*
U.S. Cl. 16—49 **2 Claims**



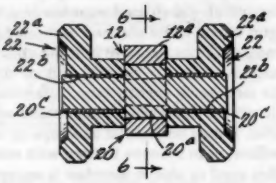
A door check and door stop combination. The door check is made up of a pneumatic cylinder and piston which control the rate at which the door closes to prevent the door from slamming. A stop is attached to the distal end of the piston rod and lies along the side of the cylinder. The stop is made of a sheet material and has a hole through it which receives the cylinder. The stop has a handle which may be engaged by the user's hand to move the stop from position in engagement with the cylinder. Gravity will cause the stop to fall into engagement with the end of the cylinder.

3,708,826
ADJUSTABLE HYDRAULIC DOOR CLOSURE
Donald A. Larson, Rice Lake, Wis., assignor to Hartzell Manufacturing, Inc., St. Paul, Minn.
Filed Nov. 30, 1970, Ser. No. 93,525
Int. Cl. E05f *3/10*
U.S. Cl. 16—52 **2 Claims**



In a door closure of the type having hydraulic fluid within a cylinder slowing or dampening the rate of retraction of a spring powered piston-piston rod assembly, a final closing kick action wherein a series of enlargements in the cylinder wall disposed near the fully retracted position of the piston allow the hydraulic fluid suddenly to by-pass the piston as it nears such fully retracted position. The closing kick action is disengagable. Where the normal closing rate of the closure is adjustable by rotation of the hydraulic cylinder a lock mechanism prevents the cylinder from inadvertent rotation except when the lock is manually released.

3,708,827
PANEL-SUPPORTING CARRIAGE
Robert E. Foltz, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.
Filed April 9, 1970, Ser. No. 27,061
Int. Cl. A47h *15/00*; B65d *25/28*
U.S. Cl. 16—98 **5 Claims**

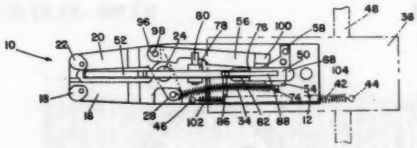


The present invention relates generally to improvements in the structure of door panel supporting carriages, and more particularly to the roller securing section of such carriages. The embodiment of the invention disclosed herein includes a carriage frame having oppositely disposed pintles extending therefrom and rollers carried by said pintles, the outer extremities of each pintle being slightly enlarged. The roller associated with each pintle has a central aperture the diameter of which is slightly less than the outer diameter of the pintle enlargement, said rollers being sufficiently yieldable to permit telescopic assembly thereof with a complementary pintle.

3,708,828
BONE HOLDING MECHANISM
Wayne R. Cain, Grand Rapids; Konrad H. Marcus, Konrad H., and Edgar D. Prince, both of Holland, all of Mich., assignors to Prince Corporation, Holland, Mich.
Filed March 11, 1971, Ser. No. 123,246
Int. Cl. A22c *17/04*
U.S. Cl. 17—1 G **23 Claims**

This disclosure relates to a bone holding mechanism for supporting a bone by one end thereof while meat stripping operations are performed. In one of its embodiments, the invention relates to an apparatus which holds the tibia bone with the meat thereon while removing the fibula bone prior to the

meat stripping operation. In another embodiment of the invention, the mechanism holds the tibia bone while the entire meat is being stripped. In each embodiment, the bone holding mechanism comprises a pair of cam-controlled, resiliently biased, movable jaws. In response to insertion of a bone, a triggering mechanism allows the jaws to move toward each other



to hold the bone from rotational and longitudinal movement. In a more specific aspect of the latter embodiment, a sliding gate, in response to the triggering mechanism, is moved into a position adjacent to the ends of and surrounding the jaws to hold the bone from movement while deboning operations are performed. At the completion of the deboning operation, the jaws are released, and the bone is released from the holder.

3,708,829

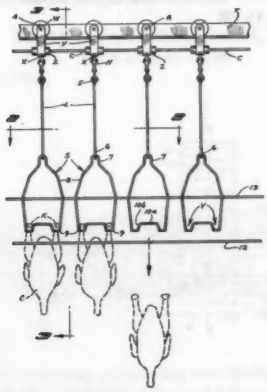
ARTICLE-RELEASE SHACKLE FOR TROLLEY-SUPPORTED HANDLING SYSTEMS TO FACILITATE PROCESSING

Glenn A. Klevgard, Faribault, Minn., assignor to Domain Industries, New Richmond, Wis.

Continuation-in-part of Ser. No. 1,720, Jan. 9, 1970, Pat. No. 3,656,206. This application Feb. 19, 1971, Ser. No. 116,755

Int. Cl. A22c *21/00*

U.S. Cl. 17—11 **3 Claims**



A shiftable and article-releasable shackle for use with a trolley-supported handling system to facilitate processing, such as the evisceration of poultry, which utilizes a multiplicity of vertically suspended shackle elements, suspended at upper ends from the trolley system and having adjacent the lower extremities thereof retaining elements for interconnection of the suspended articles. In operation and functional structure, an abutment cable and/or deflection elements are fixedly mounted at a point or points in the course of travel of the shackles for striking against and preferably camming the shackles angularly and particularly the retaining elements in such a way as to release the articles which then drop with the aid of gravity.

3,708,830

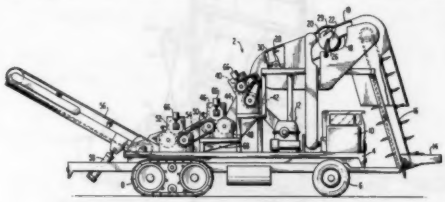
ABACA CHIPPER MACHINE

Francisco M. Gomez, Rm 401 Vicente Madrigal, Ayala Avenue, Rizal, Philippines

Filed May 17, 1971, Ser. No. 143,962

Int. Cl. D01b *1/00*

U.S. Cl. 19—5 R **2 Claims**



The machine accepts cut lengths of fibrous plant stem, and slices and cuts them into chips, and then crushes and squeezes them to partially defibered and de-watered condition. In the crushing and squeezing, the chips are fed by a pair of conveying endless chains to a squeeze-pass between circumferentially and chevron grooved rollers.

3,708,831

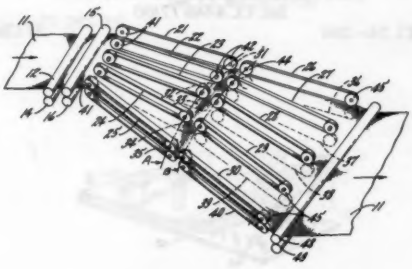
METHOD AND APPARATUS CROSS-DRAFTING FIBROUS NONWOVEN WEBS

William H. Burger, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 4, 1970, Ser. No. 34,148

Int. Cl. D01h *5/00*; D06c *3/00*

U.S. Cl. 19—236 **12 Claims**



Apparatus and method are described for cross-drafting fibrous nonwoven webs. A web is grasped by a plurality of endless belts which diverge laterally to stretch the web in a cross-machine direction. Two or more sets of belts are employed to initially grasp the web across a transverse line normal to the length of the web, to stretch each increment of the web by an approximately equal amount, and to release the web simultaneously across a second transverse line normal to the web. The resulting web is of increased width and decreased thickness in comparison to the initial web, and each increment of the web is stretched or cross-drafted by an approximately equal amount.

3,708,832

METHOD FOR LEVELING TOW

James L. Lohrke, Birmingham Township, Chester County, Pa., assignor to Turbo Machine Company, Lansdale, Pa.

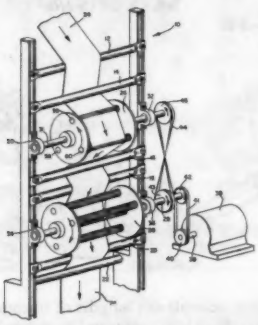
Filed Aug. 10, 1970, Ser. No. 62,393

Int. Cl. D01d *1/02*

U.S. Cl. 19—65 T **1 Claim**

A device is provided acting upon a multifilament continuous filament tow band to improve the levelness of the tow

band prior to further processing by intermittently transversely displacing some, but not all of the filaments of said tow at different locations across the tow band and allowing a sufficient tow path line of travel to allow the filaments to achieve new equilibrium locations with respect to each other.

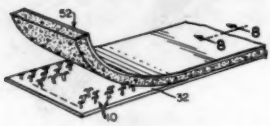


3,708,833

SEPARABLE FASTENING DEVICE

William A. Ribich, Lexington; Charles Kojabashian, Sudbury, both of Mass., and Lauret H. Girard, Bedford, N.H., assignors to American Velcro, Inc., New York, N.Y.

Filed March 15, 1971, Ser. No. 124,066
Int. Cl. A44b *17/00*
U.S. Cl. 24—204 **21 Claims**



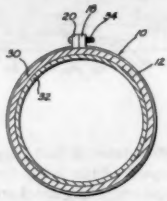
A separable fastening device having first and second separable members wherein the first member has a surface of upstanding spear-like protuberances extending from one broad surface of its base and the second member has a surface of complementary engaging elements. The spear-like protuberances are characterized by the property that when the first and second separable fastener members are pressed into face-to-face relationship the spear-like protuberances on the first separable member penetrate the surface of the second separable member and engage the complementary engaging elements of the second separable member and resist separation parallel to the interfacial plane of engagement but are readily separable by peeling forces applied substantially normal to this interfacial plane. The first separable member having a surface of spear-like protuberances has particular utility as part of a separable fastener having reticulated urethane foam as the second complementary member, however it also provides a superior fastening device when used with a second separable member having a surface of complementary engaging elements in loop form.

3,708,834

STRETCH CLAMP

Charles B. Anderson, Spring Lake, and William H. Tuggle, Jr., Nunica, both of Mich., assignors to Atco Rubber Products, Inc., Grand Haven, Mich.

Filed Feb. 1, 1971, Ser. No. 111,569
Int. Cl. B65d *63/06*
U.S. Cl. 24—279 **2 Claims**



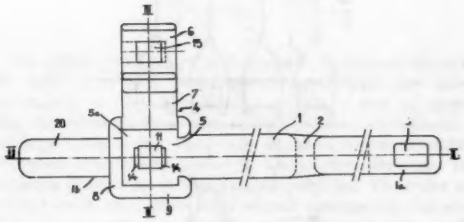
A stretchable clamp as for hoses and the like, of an integral band of polymeric material with bosses protruding from one face and having aligned orifices to receive a threaded fastener.

3,708,835

SECURITY SEAL

Hans Bienz, 9326 Horn, Switzerland, assignor to Stoba AG, Horn, Switzerland

Filed March 13, 1972, Ser. No. 234,108
Claims priority, application Switzerland, March 24, 1971, 4327/71
Int. Cl. B65d *63/00, 55/06*
U.S. Cl. 24—16 PB **16 Claims**



A security seal having a flexible strip intended to be piercingly inserted through at least one opening of an article which is to be sealed, both ends of the strip after having been flexed over upon themselves being non-releasably connected with one another. To that end the flexible strip is provided at one end with at least a portion of a closure and at its other end either with the other portion of the closure or carries an element which can be engaged with the closure. The one closure portion of the aforesaid closure forms a container or receiver, at the base of which there protrudes a head constructed as a catch element and the other closure portion is formed by a plate which fits in the form of a cover in such container and has a locking element in the form of a recess into which extends shoulder means which, during closing of the seal and pressing of the head into such recess engages behind such head and in its inserted position non-releasably fixes same.

3,708,836

WARP-KNIT SLIDE-FASTENER STRINGER

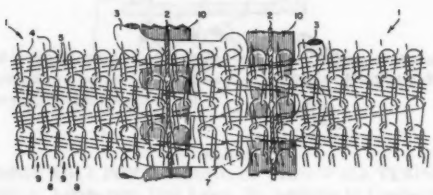
Alfons Frolich; Marie-Luise Cappel, both of Essen, and Ernst Stubiger, Giessen, all of Germany, assignors to Opti-Holding A.G., Glarus, Switzerland

Filed Oct. 20, 1970, Ser. No. 82,327

Claims priority, application Germany, April 4, 1970, P 20 16 141.5

Int. Cl. A44b *19/40*

U.S. Cl. 24—205.1 C 8 Claims



A slide-fastener stringer comprises a pair of warp-knit tapes having confronting edges carrying respective coupling elements. Each tape consists of a knit foundation formed by a plurality of transversely offset longitudinally extending warp chains joined together transversely by a plurality of laid-in weft filaments. The guide bars for the warp chains can move in a 0-1/1-0 or 2-0/0-2 pattern, or a pair of warp chains with these patterns can be knit. The guide bars for the weft filaments move in a 4-4/0-0 pattern, laying these filaments into each course. The knit is thermofixed and formed with holes along the edges for accommodating the stitching securing the coupling elements. Heavy crimped or textured bulk yarn is used as weft filament.

3,708,837

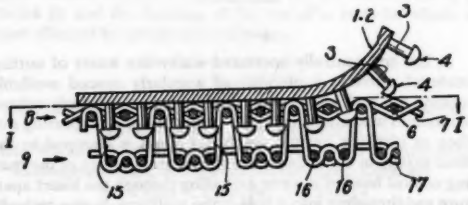
IMPROVED FABRIC FASTENER

Yoshio Chiba, Osaka, Japan, assignor to Kanebo, Ltd., Tokyo, Japan

Filed May 13, 1970, Ser. No. 36,750

Int. Cl. A44b *17/00*

U.S. Cl. 24—204 1 Claim



The fabric fastener comprising two cloths adapted to engage with each other, wherein one of them is provided with the numerous mushroom engaging sections on its surface, while the other one is a two-ply cloth composed of two pieces of cloth combined by connecting strings and one of these two pieces is made to have numerous meshes in its surface.

3,708,838

PUSH BUTTON BUCKLE

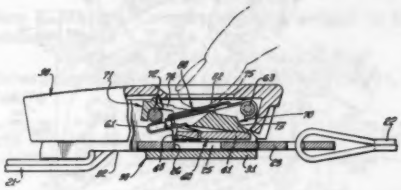
Teodoro J. Gonzalez, Panorama City, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Nov. 16, 1971, Ser. No. 199,294

Int. Cl. A44b *11/26*

U.S. Cl. 24—230 A 10 Claims

A push button buckle for use in a safety restraint system in combination with a mating tongue plate connector whereby only a small force is required to release the buckle from the mating connector even when the restraint system is in tension through the application of a load. The buckle comprises the conventional base, pivotally mounted latch lever, spring for biasing the latch lever to the locking position, and with the improvement comprising a first push button lever pivotally mounted adjacent one end and in contact with the latch member at its opposite end and a second push button lever also pivotally mounted at one end at a spaced apart location from the pivotal mounting of the first push button lever and overlying the first push button lever, whereby the application of force on the second push button lever which is exposed through a cover of the buckle engages and pivots the first push button lever which moves the latch member to a release position and in which the first and second push button levers are so arranged and proportioned so as to provide a mechanical advantage to reduce the force required to release the buckle from the mating connector.



3,708,839

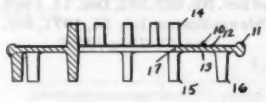
LOOM

Joyce Dickey Prince, Box 1751, Erie, Pa.

Filed March 24, 1971, Ser. No. 127,540

Int. Cl. D03d *29/00*

U.S. Cl. 28—15 6 Claims



A loom for weaving designs is disclosed. The loom is made up of a round platelike disk body having an opening in its center and a single row of pins projecting axially from the first side of the disk adjacent the hole. A similar row of pins projects from the second side. The second side also has a second row of pins projecting from it adjacent the outer periphery. When the yarn is formed on both sides of the loom, the center can be sewed together to hold the loops of threads firmly in position. The flower can then be set into an afghan or blanket by crocheting the periphery in place on a cloth or it can be crocheted to other similar flowers.

3,708,840

TRIMMING APPARATUS

John W. Oberloier, Beaverton, Mich., assignor to Oberloier Enterprises, Inc., Beaverton, Mich.

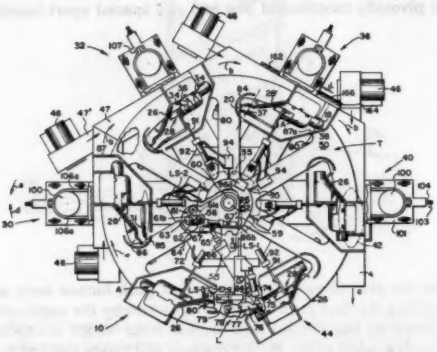
Filed Oct. 8, 1970, Ser. No. 79,206

Int. Cl. B23p *23/00*

U.S. Cl. 29—38 C 6 Claims

Apparatus for trimming hollow plastic articles including a turntable for supporting and moving articles positioned thereon in a circumferential path, at least one saw member at

a peripherally disposed saw station, mounted on a support arm for swinging movement between radially spaced inoperative and operative cutting positions for removing at least one end portion of the article, a plunge milling member for cutting an



aperture in the wall of the part, and a cutting member movable in a generally tangentially path of travel along a plane intersecting said aperture to remove an end portion of the article outwardly of the aperture to provide a cutout in the article.

3,708,841

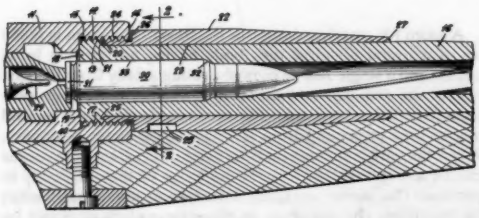
METHOD OF MAKING FIREARMS HAVING INTERCHANGEABLE BARRELS

James L. Quinney, Jackson, Wyo., assignor to Idaho Bank of Commerce, Rexburg, Idaho

Division of Ser. No. 885,382, Dec. 15, 1969, Pat. No. 3,611,611. This application July 16, 1971, Ser. No. 163,215

Int. Cl. B23p *13/00*

U.S. Cl. 29—1.1 **1 Claim**



A firearm having interchangeable barrels wherein each barrel is attached to the receiver portion of the firearm and is prevented from relative rotation with respect thereto by a locking sleeve which fits over the barrel. The barrel is screwed into a threaded bore in the receiver of the firearm until its end face abuts a seating surface therein. The sleeve is then fitted over the barrel and screwed into the same bore in the receiver as the barrel until its end abuts the threaded portion of the barrel. Any tendency of the barrel to rotate out of the receiver is effectively prevented by the locking action of the sleeve.

3,708,842

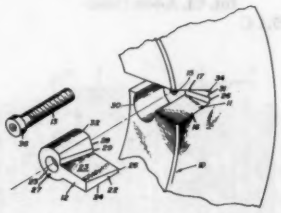
CUTTING TOOL WITH REPLACEABLE TEETH

Martin Norman Hamilton, R.D. No. 4, Meadville, Pa.

Filed March 30, 1970, Ser. No. 23,615

Int. Cl. B26d *1/12*

U.S. Cl. 29—105 A **3 Claims**



The specification discloses a cutting tool having at least one tooth. The tooth is supported in a cutter support in a notch and has a threaded stud passing through a wedge key clamping the tooth in place. The tooth bottoms on a rib having a curved top.

3,708,843

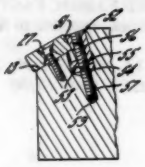
HOLDER FOR INDEXABLE CUTTING INSERT

Donald A. Erkfritz, Rockford, Ill., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Division of Ser. No. 17,605, March 9, 1970, Pat. No. 3,662,444. This application Nov. 5, 1971, Ser. No. 196,149

Int. Cl. B26d *1/12*

U.S. Cl. 29—105 A **5 Claims**



A flat and centrally apertured wafer-like insert of cutting material provides a plurality of angularly spaced available cutting tips and is located edgewise against angularly related abutments upstanding from the inner edge of a supporting surface or platform against which the insert is clamped in the final seating in a conical end of the insert aperture of the mating conical head of a screw extending through the insert aperture and threading into a hole in the platform. In one embodiment, one of the locating abutments is defined by the inclined surface of a wedge which may be threaded into and out of the body to adjust the edgewise position of the insert. In another embodiment, one of the locating abutments is on a plate formed separately of and spot welded to the body and capable of being removed and replaced if damaged during service use of the cutter.

3,708,844

REPLACEABLE ROLL ASSEMBLY

Harry H. Rawson, 2540 S. Garfield Road, Spokane, Wash.

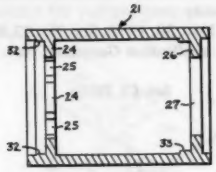
Filed March 12, 1971, Ser. No. 123,577

Int. Cl. B65g *13/00*; B21b *31/08*; B60b *7/04*

U.S. Cl. 29—123 **2 Claims**

A roll assembly for heavy conveyor use, such as in the feed assembly for a wood planer. The cylindrical shell or roll is

replaceable on a mounting shaft assembly and can be reversed between adjacent roll assemblies to increase its useful life. The



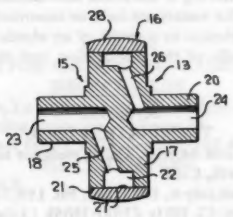
shell is rigidly supported by complementary hubs permanently mounted to a central shaft so as to be capable of withstanding heavy loading forces in use.

3,708,845

FORGE ROLL FOR WELDING OF THIN-WALL TUBING

Anton A. Aschberger, Oak Lawn, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Jan. 19, 1971, Ser. No. 107,641
Int. Cl. B21b *31/08*
U.S. Cl. 29—132 **2 Claims**



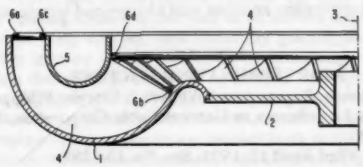
This invention relates to a pressure roll which may be utilized either solely for the application of pressure in the formation of a forge welded seam, or may be utilized both for the application of pressure and the introduction of electrical energy in the forming of a welded seam in tubing. The roll is constructed so as to have a full flow of coolant therethrough and is of a two-piece construction including a hub and a tire. Principal features are the securement of the tire on the hub by a shrink fit and the forming of the tire of a material which is least affected by temperature changes.

3,708,846

METHOD FOR FASTENING THE BLADES OF A ROTOR FOR HYDRODYNAMIC UNITS

Otto Worner, Reutlingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed May 7, 1970, Ser. No. 35,512
Claims priority, application Germany, May 10, 1969, P 19 23 953.3
Int. Cl. B21k *3/04*; **B23p** *15/02, 15/04*
U.S. Cl. 29—156.8 CF **4 Claims**



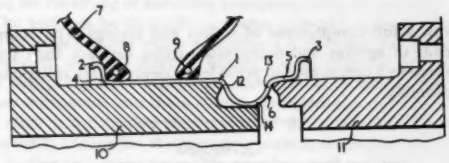
A method for fixing the blades of a rotor for a hydrodynamic unit in which the blades are assembled and preliminarily held in position within the shell of the rotor and wires made of soldering or brazing material and bent into the shape of rings are placed on the blades at their places of abutment at the shell housing; after the assembly of the parts as described, the rotor unit is heated above the melting point of the soldering or brazing material and thereafter cooled whereby the soldering or brazing material flows by gravity into the gaps between the blades and the shell.

3,708,847

METHOD OF MOUNTING PNEUMATIC TIRE ON VEHICLE WHEELS

William E. Mitchell, Coventry, England, assignor to Dunlop Holdings Limited

Filed March 18, 1971, Ser. No. 125,513
Claims priority, application Great Britain, March 21, 1970, 13,746/70
Int. Cl. B21h *1/02*; **B21k** *1/32*
U.S. Cl. 29—159.01 **4 Claims**



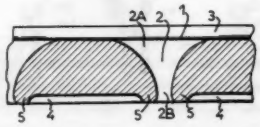
A method of mounting a pneumatic tire on a wheel rim having side flanges and a radially inwardly depressed well portion comprises fitting the tire to the rim by a method employing the said well portion, and subjecting the well portion of the rim to axial compression so as to reduce the axial width of the well portion.

3,708,848

METHOD OF MANUFACTURING FILTER ELEMENTS

Paul Andre Guinard, 7 rue Pozzo di Borgo, Saint Cloud 92, France

Filed Nov. 25, 1970, Ser. No. 92,690
Claims priority, application France, Nov. 27, 1969, 6940925
Int. Cl. B23p *15/16*
U.S. Cl. 29—163.5 F **3 Claims**



A method of manufacturing a slotted filter element comprising the steps of forming opposite sides of the filter elements by respective electrolysis operations carried out to different degrees so that the slots in cross-section are more flared towards one side than the other, and swaging the filter element to give the slot cross-section the form of a single funnel.

3,708,849

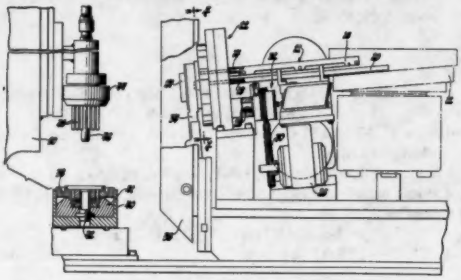
AUTOMATED ROLLER CLUTCH ASSEMBLY

Howard M. Meyer, Ypsilanti, and Mayo M. Reichardt, Milford, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 26, 1971, Ser. No. 166,100
Int. Cl. B23p *19/04*; **B23q** *7/10*
U.S. Cl. 29—201 **6 Claims**

An apparatus for automatically assembling compressed springs and rollers into an overrunning roller clutch assembly comprises a pair of intermittently rotated plates pivoted on spaced parallel axes. One plate has a plurality of loading chambers with reciprocating slides which receives the rollers,

combines them with springs, compresses the springs and delivers sets of compressed springs and rollers to a transfer hub carried by the second intermittently rotated plate. Upon one complete rotation of the plates, the transfer hub is loaded



with a full complement of rollers and springs. The complement of springs and compressed roller sets are then transferred to a clutch race to provide the overrunning roller clutch assembly.

3,708,850

MEANS FOR SECURING A BODY TO A PANEL

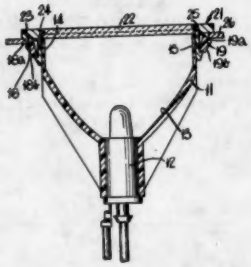
Rex Martin, Blackburn, England, assignor to Joseph Lucas Industries Limited, Birmingham, England

Filed April 29, 1970, Ser. No. 32,871

Claims priority, application Great Britain, July 7, 1969, 34,131/69

Int. Cl. H01r *19/04*

U.S. Cl. 29—203 P **1 Claim**



Means for securing a body to a panel including a pair of torsion bars on the body on opposite sides thereof. The torsion bars are spaced from the body and each torsion bar includes an outwardly projecting lug the lugs being positioned intermediate the ends of the torsion bars. The distance between the outer edges of the lugs is greater than the distance between opposite sides of a hole in a panel into which the body is to be inserted, and there is provided a retaining member engageable with the body. The retaining member is capable of engaging the panel around the hole in the panel, and includes a pair of fingers which extends between the lugs and the body when the member is engaged with the body. The fingers each include portions which engage the lugs on the torsion bars so as to prevent disengagement of the body from the member. When the body and the member are interengaged and the body is inserted through the hole in the panel the lugs engage in the opposite sides of the hole and the torsion bars are twisted to permit the lugs to pass through the hole. The torsion bars then restore the lugs to their original position so that the lugs engage with the under surface of the panel while the retaining member engages the upper surface of the panel so that the lugs and the retaining member secure the body to the panel.

3,708,851

HOLDING DEVICE FOR SEMICONDUCTOR WAFERS

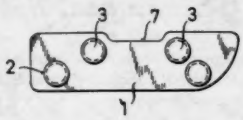
Liboslav Vladik, Nurnberg, Germany, assignor to Semikron Gesellschaft fur Gleichrichterbau und Elektronick mbH, Nurnberg, Germany

Filed Nov. 30, 1970, Ser. No. 93,821

Claims priority, application Germany, Nov. 29, 1969, P 19 60 121.9

Int. Cl. H01g

U.S. Cl. 29—203 **12 Claims**



The semiconductor wafers for a rectifier circuit of the type wherein the conductors are formed from a single sheet of conductive material and shaped so that wafers may be inserted therebetween, are all simultaneously inserted and held in place by means of a holding device or jig which then remains in the finished device. The holding device is a sheet or plate of synthetic material having perforations or openings corresponding to the desired locations of the wafers in circuit arrangement and having a thickness substantially equal to that of the wafers. The wafers are held or mounted in the perforations by static friction as a result of an elastic layer provided between the walls of the perforation and the edges of the wafer.

3,708,852

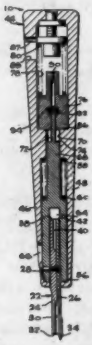
TERMINATION TOOL

John R. Mason, Los Angeles, Calif., assignor to Dracon Industries, Chatsworth, Calif.

Filed July 6, 1971, Ser. No. 159,749

Int. Cl. H01r *43/00*; H05k *13/04*

U.S. Cl. 29—203 H **10 Claims**



Termination tool for making terminations of unskinned wires on 66-type telephone wire connecting blocks. The tool has an insertion stroke during which manual load on the tool compresses a spring and releases a hammer stroke, which completes termination and cuts wire end beyond termination.

3,708,853

WIRE TERMINATING MACHINE

Nicholas Humen, Bayonne, and William J. Brorein, Whippany, both of N.J., assignors to General Cable Corporation, New York, N.Y.

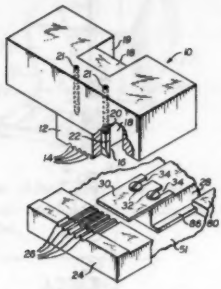
Filed April 15, 1971, Ser. No. 134,288

Int. Cl. H01r *43/04*

U.S. Cl. 29—203 D **12 Claims**

This machine applies insulation piercing terminals to a plurality of conductors simultaneously and cuts off the conduc-

tors where they extend beyond the barrels of the terminals. A cut-off blade attached to the upper crimping die cuts against an anvil that extends across the tops of the terminals beyond the barrels but under the end portions of the conductors that



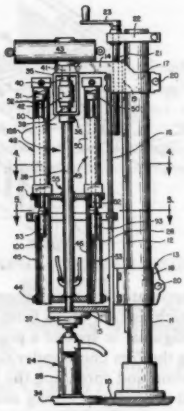
are to be cut off. The blade cuts against the anvil which is preferably made of brass so that the blade can dent the anvil, and accurate alignment of the blade is therefore unnecessary and the blade can cut even though dull.

3,708,854

APPARATUS FOR ASSEMBLING CLOSURE CAPS TO RECEPTACLES

John C. Nalbach, La Grange Park, Ill., assignor to John R. Nalbach Engineering Company, Chicago, Ill.

Filed Jan. 4, 1971, Ser. No. 103,504
Int. Cl. B23p *19/04*
U.S. Cl. 29—208 B **20 Claims**



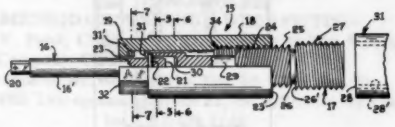
An apparatus for assembling a closure cap fitted with a valve device and an elongated, flexible dip tube within the filling opening formed in the neck of an aerosol dispenser type container body and for simultaneously guiding the dip tube into the interior of the container body through the filling opening during such assembly operation. The apparatus includes engaging means for frictionally engaging a closure cap at a closure cap-feeding work station, means for transporting the engaged closure cap to a container body at a closure cap-placement work station, means for simultaneously guiding the flexible dip tube into the container body and disengaging the closure cap from the engaging means, and means for thereafter returning the engaging means to the closure cap-feeding work station to frictionally engage another closure cap.

3,708,855

APPARATUS FOR REMOVING COUPLINGS FROM TUBULAR GOODS

Grady O. Whiteside, 2908 Dawn, and Thomas Y. De Priest, 3736 Oakridge, both of Odessa, Tex.

Filed April 12, 1971, Ser. No. 133,000
Int. Cl. B23p *19/04*
U.S. Cl. 29—237 **5 Claims**



A tool for removing couplings from tubular goods, especially for removing or installing a coupling onto a sucker rod.

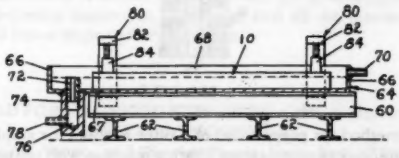
The tool can be manually or motor powered in operation, and includes a barrel within which there is threadedly received a mandrel, with the mandrel having a shaft attached thereto and depending from within the barrel so as to impart rotational movement into the mandrel. Diametrically opposed to the shaft is a threaded pin portion of the mandrel which is adapted to engage the threaded box portion of the coupling of the sucker rod, so as to enable one threaded surface of the mandrel to threadedly engage a coupling while the remaining threaded surface of the mandrel threadedly engages the barrel, with a part of the coupling and the barrel being brought into abutting relationship with respect to each other in a manner to develope tremendous torsional forces.

3,708,856

PROCESS FOR REPAIRING WORN AND DEFORMED RAILWAY FROGS

John N. Keifer, Indianapolis, Ind., assignor to Indiana Metal Treating Inc. Indianapolis, Ind.

Filed Sept. 3, 1971, Ser. No. 177,708
Int. Cl. B23p *7/00*
U.S. Cl. 29—401 **11 Claims**



Worn and deformed railway crossing frogs are repaired thus: (a) arc-gouge away cracks and battered and work-hardened metal, (b) weld-in gouged cavities while cooling the frog in a water bath, (c) build up new wear surfaces with rod or wire-fed welding while the frog is cooled in the water bath, (d) notch the base walls and flanges (or cut completely apart) to permit straightening, (e) clamp in straightened position, (f) weld in the notches (or reweld the cuts) and (g) machine or grind to shape and size.

3,708,857

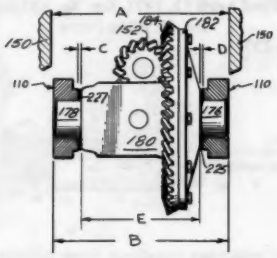
METHOD FOR ASSEMBLING A DIFFERENTIAL

Richard D. Pfeiffer, 410 102nd S.E. No. 24, Bellevue, Wash.

Filed June 21, 1971, Ser. No. 155,138
Int. Cl. B23q *17/00*
U.S. Cl. 29—407 **22 Claims**

This disclosure is for a jig measuring block and the method of using the jig measuring block. The jig measuring block if of use in aligning gears in a differential, a transmission and final drives in small and large machinery such as small trucks,

wheel-type vehicles, crawler vehicles, and industrial material handling machinery and the like. The jig measuring block makes it possible to save time, save material and to align the



gears with greater accuracy in repairing such machinery. Further, it makes it possible for the small repair shops to economically and accurately repair such machinery.

3,708,858

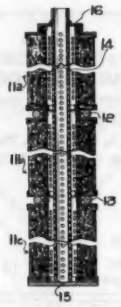
METHOD FOR PREPARATION OF A FILTER MEDIUM

Jiro Sasaki, 2-4067, 2-chome, Ninyo-cho, Nara, Japan

Filed Jan. 15, 1971, Ser. No. 106,785

Int. Cl. B23p *17/00*

U.S. Cl. 29—419 **8 Claims**



A method for preparation of a filter medium for employing in a precise or super-precise filtering machine with an industrial scale wherein a predetermined amount of fibrous or powder-like raw material is compressed into a predetermined space in dry condition and the thus formed body of said raw material is immersed in a liquid so that a filter medium having intended characteristics is obtained by utilizing the high pressure of swelling caused in said predetermined or defined space and the plasticity of the material. The treated medium body is always kept in wet condition.

3,708,859

METHOD FOR ASSEMBLING SPRING-BIASED HINGE PIN UNIT

Robert H. Bitney, 10649 Morengo Drive, Cupertino, Calif.

Filed Feb. 16, 1971, Ser. No. 115,517

Int. Cl. B23p *19/00*

U.S. Cl. 29—430 **7 Claims**

A method for assembling a hinge pin unit of the type having a coil spring mounted on and surrounding one end margin of a hinge pin with one end of the spring being coupled to spring tension adjustment means at the end of the hinge pin and the opposite end of the spring being coupled to a first, rotatable extension on the hinge pin near a second extension fixed to the hinge pin. The two extensions are adapted to engage a pair of hinge leaves to bias the same in predetermined directions rela-

tive to each other. The method permits the assembly of the unit as the hinge pin is moved along a predetermined path.

3,708,860

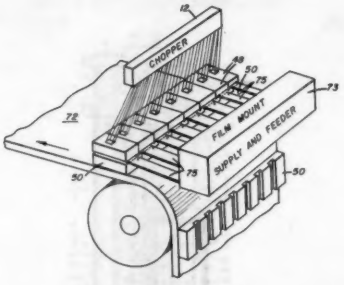
METHOD AND APPARATUS FOR CHOPPING A PLURALITY OF ARTICLES AND DEPOSITING THE ARTICLES IN COMPLEMENTARY ARTICLE RECEPTORS

Gene A. Bolster, Rush, and Alva F. Mathes, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed March 4, 1971, Ser. No. 120,950

Int. Cl. B23p *19/00, 23/00;* B23q *7/10*

U.S. Cl. 29—430 **15 Claims**



A method and apparatus for simultaneously chopping a plurality of articles such as film chips from a web in which the film chips are contiguous or spaced a predetermined distance apart, transporting the film chips under the influence of gravity to a loading station and spreading the articles apart during such transport and precisely orienting and depositing the film chips in complementary film chip receptors which are positioned at the loading station in side-by-side relation. A plurality of guide tracks with the assistance of air jets transport the film chips from the chopping mechanism to the film chip receptors. Each of the guide tracks cooperates with mechanism at the loading station for precisely orienting and depositing each film chip in its complementary receptor.

3,708,861

METHOD OF SECURING A CONTAINER TO A PALLET

Gordon P. Hickey, White Bear Lake, Minn., assignor to Hoerner Waldorf Corporation, Ramsey County, Minn.

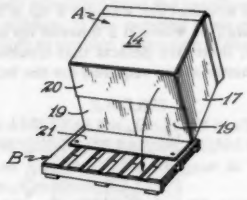
Filed June 8, 1970, Ser. No. 44,054

Int. Cl. B23p *11/00*

U.S. Cl. 29—432 **2 Claims**

A palletized container includes rectangularly arranged side walls and bottom closure flaps. One bottom closure flap is

nailed or stapled to a wooden pallet. This is done by positioning one bottom closure flap on the pallet while the container is resting upon its side, the wall to which the one bottom closure



flap being lowermost. After nailing or stapling the flap, the remaining closure flaps are folded inwardly and the container erected upon the pallet.

3,708,862

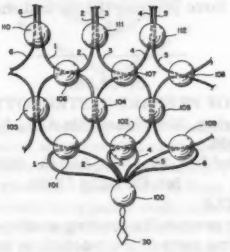
METHOD OF STRINGING BEADS

Edgar S. Powell, Jr., 7834 E. Northland Drive, Scottsdale, Ariz.

Division of Ser. No. 831,565, June 9, 1969, Pat. No. 3,650,010. This application June 10, 1971, Ser. No. 151,983

Int. Cl. B23p *19/04*

U.S. Cl. 29—433 **3 Claims**



Method for stringing beads wherein a plurality of cords, not less than six, are paired and the cords of each pair are crisscrossed in a horizontally run through a bead, resulting in a repairing, which pair is then vertically run through a bead together with a stand having a central opening for practicing the method and the resultant three dimensional string of beads.

3,708,863

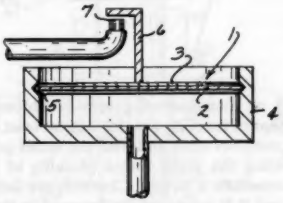
METHOD OF MAKING A TEMPERATURE SENSING ELEMENT

Paul E. Thoma, Burlington, and Frederick A. Hoffmann, Milwaukee, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed July 23, 1970, Ser. No. 57,510

Int. Cl. B32b *15/00*

U.S. Cl. 29—454 **5 Claims**



A method of making a temperature sensing element from a composite sheet composed of two or more layers of materials having different coefficients of thermal expansion. To fabricate the element, a portion of one layer is masked, while a second portion of the layer is exposed and is removed by chemical or electrolytic action to provide an element in which one layer has a substantially greater surface area than the other layer. The element is shaped to the desired size and configuration and in use the element is mounted so that the peripheral edge is rigidly attached and sealed to a mounting support.

3,708,864

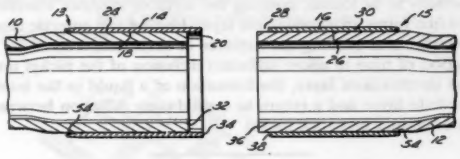
METHOD OF FORMING A WELD FITTING

Hiralal V. Patel, Cleveland, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Division of Ser. No. 885,018, Dec. 15, 1969, Pat. No. 3,635,498. This application June 22, 1971, Ser. No. 155,585

Int. Cl. B23k *31/02*

U.S. Cl. 29—479 **7 Claims**



A coupling for use in forming a welded tube joint is disclosed along with a method for forming such joint. A thin coupling sleeve is tightly swage-fitted onto the end of a tube to form a male or female tube end assembly suitable for engagement with a tubular mating part assembly which may be a fitting or another coupling sleeve and tube assembly. The male-female interlocking arrangement provides radial and axial alignment of the joined assemblies. The structure is arranged to provide a space between the tube end face and the interior end face of the tubular mating part assembly. During the welding operation, external fusion heat is applied to form a single weld bead extending from the interior of the tube to the exterior surfaces of the assemblies. The width of the weld at its inner radial extremities is longer than the axial width of the space between the interior end faces and its width at its outer radial extremities is at least equal to twice the axial length of the male-female telescoped portion so that all the members are fused into a single unitary structure.

3,708,865

METHOD FOR MAGNETIC EXPLODING COIL WELDING IN SPECIAL ATMOSPHERES

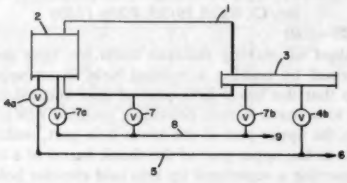
Michel Grin, Varese, and Dietrich Pruess, Ispra, both of Italy, assignors to European Atomic Energy Community (Euratom)

Continuation-in-part of Ser. No. 885,188, Dec. 15, 1969. This application Sept. 30, 1970, Ser. No. 76,885

Claims priority, application Luxembourg, Dec. 16, 1968, 57,553

Int. Cl. B23k *21/00*

U.S. Cl. 29—470.1 **10 Claims**



A hollow body such as a nuclear fuel pencil is exhausted of air and filled with a desired gaseous atmosphere through an

opening in the body while within a gas-tight enclosure, is sealed together with a closure member for the opening within a gas-tight flexible bag. The bag containing the body and closure member is removed from the enclosure and the closure member welded to the body by magnetic exploding coil welding while in the bag.

3,708,866

THIN FILM DIFFUSION BRAZING OF NICKEL AND NICKEL BASE ALLOYS

Robert R. Wells, La Mirada, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.

Filed Nov. 25, 1968, Ser. No. 778,802

Int. Cl. B23k *31/02, 35/24*

U.S. Cl. 29—498 **8 Claims**

A method for joining nickel and nickel base alloys comprising disposing a thin film of a metal selected from a class consisting of titanium and niobium (or columbium) between the surfaces to be joined, pressing the surfaces together whereby the film forms an intermediate layer, heating to a eutectic temperature and holding the surfaces at such temperature for a period of time to allow sufficient diffusion of the nickel into the intermediate layer, the formation of a liquid in the intermediate layer and a return to a solid state diffusion between intermediate layer and nickel.

3,708,867

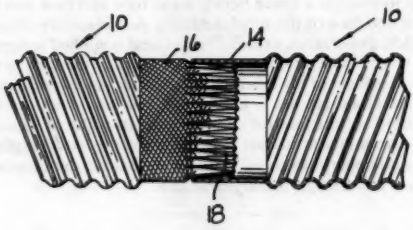
METHOD OF CONNECTING DUCT OR CONDUIT SECTIONS

Robert H. Meserole, Somerville, N.J., assignor to Johns-Manville Corporation, New York, N.Y.

Filed Nov. 12, 1970, Ser. No. 88,816

Int. Cl. B23p *19/02*

U.S. Cl. 29—525 **3 Claims**



A method of reforming ends of tubular sheet metal duct or conduit sections having helically grooved walls so as to enable such sections to be connected in end-to-end relationship.

3,708,868

METHOD OF MAKING NONSKID STUDS FOR TIRES AND SHOES

Ikuzou Amamiya, Yokohamashi, Japan, assignor to Kabushiki Kaisha Kanagawaseisakusho--Nishiterao, Kanagawaku, Yokohamashi, Kanagawa-ken, Japan

Filed April 27, 1971, Ser. No. 137,774

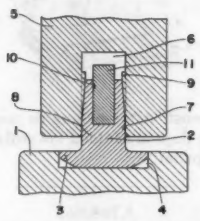
Claims priority, application Japan, Feb. 19, 1971, 46/7561

Int. Cl. B21d *39/00;* **B23p** *11/00*

U.S. Cl. 29—520 **1 Claim**

A method of making nonskid studs for tires and shoes characterized by making a vertical hole in an upper mold punch so that the lower hole part of said vertical hole may conform to a shank barrel, providing inclined ribs to project inward in the upper part of the lower hole part, making a circular hole in the upper part of the shank barrel of a columnar shank, inserting a superhard tip into said circular hole, fitting the shank in the lower mold and fixing the upper mold and lower mold to respective presses so that when the punch is lowered, the shank barrel may be compressed and fastened to be in the form of petals by the inclined ribs from above and, when the upper mold punch meets the base of the lower mold, the excess material of the shank barrel displaced by the inclined ribs may escape into respective clearances.

There has been already taken a method of making nonskid studs for tires of automobiles wherein a tip is inserted into a shank and is brazed or wherein a tapered tip is struck into a shank. However, there are defects that troubles and a large quantity of the material are required for the brazing and that



troubles are required for the operations of copper or nichel-plating the tips and derusting and washing the shanks. Further, in tapering the tip, an error is likely to occur between the hole of the shank and the taper of the tip, the pressing is on one side and therefore there is a defect that the fastening can not be made well. When a punch having no rib is calked, there is a defect that the force pressing the tip and shank hole together is weak.

3,708,869

METHOD OF PREPARING STEREOTYPE PLATES

Daniel C. Anderson, 2054 Montecito Ave., Apt. No. 18, Mountain View, Calif.

Filed Dec. 29, 1969, Ser. No. 888,888

Int. Cl. B23p *17/00*

U.S. Cl. 29—527.6 **4 Claims**

A lubricating process for treating machines and tools comprising lubricating parts of the machine or tools with a film of lecithin containing material.

3,708,870

METHOD OF MANUFACTURING SEMI-CONDUCTOR DEVICES

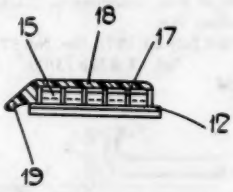
Dennis George Goodman, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed April 29, 1971, Ser. No. 138,661

Claims priority, application Great Britain, May 21, 1970, 24,550/70

Int. Cl. B01j *17/00*

U.S. Cl. 29—580 **4 Claims**



A method of manufacturing semi-conductor devices includes the steps of forming a wafer with at least one P-N zone and at least one N-N zone and with the wafer positioned on a support, dividing the wafer into a plurality of parts each of which is to constitute a device. Channels are defined between the devices and P-N junctions are exposed in the channels. A curable compound capable of protecting the P-N junctions is then poured into the channels, and the compound is cured so as to form a membrane adhering to the devices and interconnecting the devices to facilitate handling thereof. The adhe-

sion of the membrane to the devices is arranged to be substantially greater than the cohesive properties of the membrane so that, in use, the devices can be separated from the membrane by peeling the membrane from the devices. Then after the devices have been separated from the membrane, a portion of the membrane adheres to the exposed parts of the P-N junctions of the devices to provide protection of the P-N junctions.

3,708,871

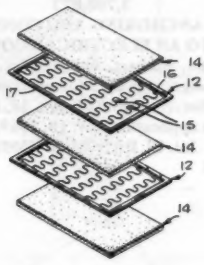
SHIELDING AND SEALING GASKET MATERIAL AND METHODS OF FABRICATING IT

Ezra Mintz, Los Angeles, Calif., assignor to Technical Wire Products, Inc., Cranford, N.J.

Division of Ser. No. 771,142, Oct. 28, 1968, Pat. No. 3,542,939. This application Oct. 2, 1970, Ser. No. 77,743

Int. Cl. H01s *4/00*

U.S. Cl. 29—592 **9 Claims**



A new shielding and sealing gasket material which comprises parallel, spaced apart continuously corrugated, electrically conductive wires which are supported in a homogeneous resilient body of material. Each wire defines a longitudinal axis extending between its opposite ends, with successive corrugations extending on opposite sides of the axis. The number of corrugations per inch and the corrugations' peak to peak spacing being easily variable. The method for producing the material includes the steps of forming a stack of sheets of plastic resilient material, with a separate plurality of parallel, spaced apart continuously corrugating wires between adjacent sheets, followed by a step of bonding the sheets together to form a homogeneous resilient body of material.

3,708,872

METHOD OF PRODUCING A MOLDED COMMUTATOR

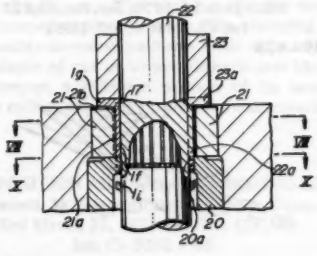
Yasushi Ohuchi; Hisanobu Kanamaru, and Teruhisa Honshima, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 5, 1970, Ser. No. 43,788

Claims priority, application Japan, June 13, 1969, 44/47175

Int. Cl. H01r *43/00*

U.S. Cl. 29—597 **3 Claims**



A flanged cylindrical body formed by suitable means is disposed in a cavity die assembly and then a plurality of commutator bar dividing grooves and commutator riser dividing grooves are formed in the flanged cylindrical body rectilinarly by a suitable stamping operation, without resorting to mechanical cutting at all, while taking the flow balance of the material into consideration, thereby to form a shrink ring for the commutator. Thereafter, a molding material is charged into the thus formed shrink ring for the commutator and the material connecting the commutator bars and commutator rises is removed, whereby a molded commutator is produced.

3,708,873

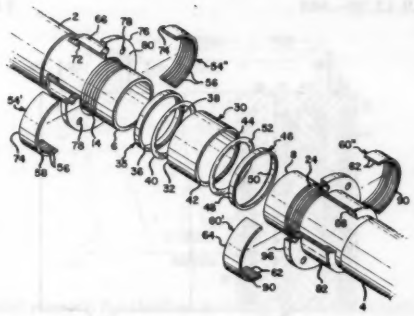
CIRCULAR WAVEGUIDE JOINT

Edwin Floyd, Jr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 865,229, Sept. 22, 1969, Pat. No. 3,560,029, which is a continuation-in-part of Ser. No. 631,841, April 18, 1967, Pat. No. 3,365,681, which is a continuation-in-part of Ser. No. 468,793, July 1, 1965, abandoned. This application June 11, 1970, Ser. No. 45,459

Int. Cl. H01p *11/00*; H01q *13/00*

U.S. Cl. 29—600 **1 Claim**



A circular waveguide connection with two grooved waveguide ends receiving thereover internally grooved rings of mating halves, a central alignment sleeve, each end of which sleeve is sealed by an elastomeric annulus, and a pressure ring associated with each annulus, the assembly covered with two mating flanged coupling members.

3,708,874

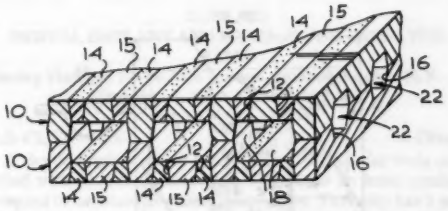
METHOD OF MAKING A BATCH FABRICATED MAGNETIC MEMORY

Howard L. Parks, Woodland Hills, Calif., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 864,616, Oct. 8, 1969, Pat. No. 3,623,037. This application Aug. 23, 1971, Ser. No. 176,411

Int. Cl. H01f *7/06*

U.S. Cl. 29—604 **9 Claims**



A magnetic wire memory construction comprising a plurality of stacked memory planes, each memory plane being formed from two like-formed self-supporting and rigid metal sheets in opposed relation. The sheets have channels formed

therein using precision batch fabricated metal sculpturing techniques, with certain of the channels being filled with insulative material. The dimensions and locations of the channels are chosen so that precisely located memory wire receiving tunnels and corresponding insulated drive line strips perpendicular thereto are formed when the sheets are placed together in opposed relation. Memory wire elements are inserted into the tunnels which protect and shield the elements and maintain them accurately positioned with respect to one another and to the drive line strips so as to permit achieving a memory of increased density and speed of operation.

3,708,875

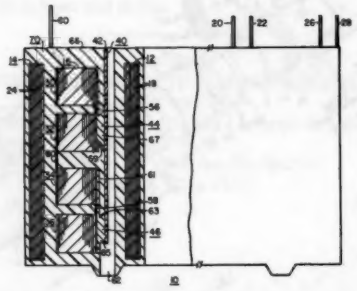
METHODS OF CONSTRUCTING ELECTRICAL INDUCTIVE APPARATUS

Paul W. Martincic, Sharpsville, and James R. Miller, Sharon, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 12,704, Feb. 19, 1970, abandoned, which is a division of Ser. No. 815,035, April 10, 1969, Pat. No. 3,548,355. This application Sept. 17, 1971, Ser. No. 181,480

Int. Cl. H01f *7/06*

U.S. Cl. 29—605 **7 Claims**



Methods of constructing electrical inductive apparatus of the type having a plurality of electrical windings encapsulated in cast solid electrical insulation. At least one of the windings has a plurality of spaced electrically connected coil sections each formed of electrically conductive foil or strip, with the coil sections being fixed to metallic coil back plate members, which are supported on spaced insulating support members.

3,708,876

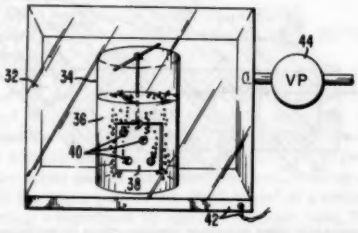
VACUUM-HEAT TREATMENT OF PRINTED CIRCUIT BOARDS

William G. Klehm, Jr., Farmington, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 28, 1969, Ser. No. 794,686

Int. Cl. B41m *3/08*; H05k *3/00*

U.S. Cl. 29—625 **9 Claims**



Relates to the avoidance of electrical discontinuities arising in the production of two-sided printed circuit boards having plated-through-holes and particularly occurring in the use of solder for improving the electrical interconnections. Research disclosed that the cause of these discontinuities lay in the material of the boards surrounding the holes which either included entrapped gas or matter vaporizable under the high temperatures of the liquid solder applied to fill the holes to assure reliable plated-through-hole connections. A vacuum evaporation operation was incorporated in the fabrication process and found highly useful and efficient in the production of reliable hole connections substantially reducing if not completely eliminating any need to apply solder touch-ups to the boards thereafter. Specifically, the boards were treated prior to the soldering of the plated-through holes to a temperature of approximately 250° F while concurrently being exposed to a vacuum of approximately 10^{-3} mm Hg for a sufficient time to drive out of the boards all matter vaporizable under such conditions.

3,708,877

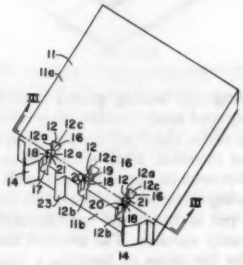
METHOD OF ANCHORING AND CONNECTING LEAD WIRES TO AN ELECTRICAL COMPONENT

Joseph Digirolamo, Elkhart, and Stanley O. Bender, Berne, both of Ind., assignors to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 698,824, Jan. 18, 1968, Pat. No. 3,492,536. This application Nov. 10, 1969, Ser. No. 875,278

Int. Cl. H01r *43/00*; H05k

U.S. Cl. 29—628 **3 Claims**



A method for anchoring a lead wire in an electrical component having a ceramic dielectric substrate is provided wherein a portion of the lead wire is placed over an opening of a notch in the substrate and forced into the notch. The notch is provided with a constricted section and an enlarged section. Application of the force deforms the lead wire and wedges a portion of the lead wire into the notch to conform at least partially to the sections of the notch.

3,708,878

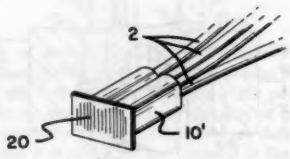
WIRE CONNECTION, METHOD, AND CONNECTING APPARATUS

Richard Charles Mann, Sr., Hershey, and Glendon Henry Schwalm, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 11, 1970, Ser. No. 45,522

Int. Cl. H01r *43/00*; H05k

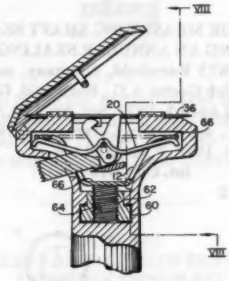
U.S. Cl. 29—628 **3 Claims**



Electrical connection is formed between one or more film-insulated wires and a terminal by crimping the terminal onto

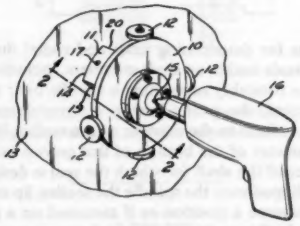
the end of the insulated wire(s), facing the end of the wire(s) and terminal so that they are co-planar, and ultrasonically welding commoning plate of conductive metal to the wire and terminal ends so that conducting path is formed through the conducting plate.

3,708,879
RAZOR HEAD
Charles F. Stephenson, Rowayton; Kenneth A. Van Dyck, Weston, and James B. Wyatt, Stamford, all of Conn., assignors to The Gillette Company, Boston, Mass.
Division of Ser. No. 26,588, April 8, 1970, Pat. No. 3,650,027. This application July 19, 1971, Ser. No. 163,729
Int. Cl. B26b *21/32*
U.S. Cl. 30—61 **4 Claims**



A razor head having a cap portion mounted thereon and adapted to pivot upon one end of the razor head, the cap being held and released by a hook latch means disposed in the razor head. The exposure of the blade is varied by a rotatable adjusting spindle connected to a blade guard.

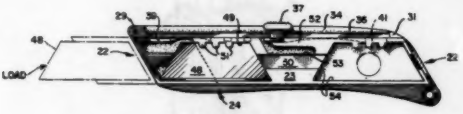
3,708,880
SCARIFIER FOR WALL COVERINGS
John H. Norfleet, 15006 Naples Street, Cleveland, Ohio
Filed Aug. 17, 1970, Ser. No. 64,490
Int. Cl. B26b *3/00*
U.S. Cl. 30—172 **18 Claims**



A tool for scoring a wall covering, such as one or more thicknesses of wallpaper. The tool has circular saw blades which are clamped to the tool body. The clamping arrangement is releasable to permit each saw blade to be adjusted for the desired depth of cut or to permit each saw blade to be turned to present a different portion of its saw-toothed periphery for cutting engagement with the wall covering.

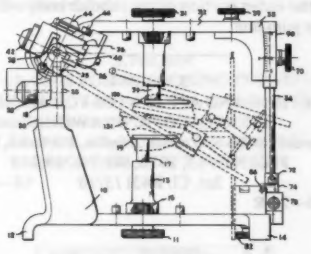
3,708,881
MULTI POSITION ADJUSTABLE ROOFING KNIFE
Robert A. Bennett, 38 Falmouth Drive, Shelton, Conn.
Filed March 22, 1971, Ser. No. 126,583
Int. Cl. B26b *1/08*
U.S. Cl. 30—320 **5 Claims**

A craftsman's utility knife or "roofing" knife with an elongated hollow casing slidingly accommodating a bladeholder slider indexable between a retracted position and plurality of extended cutting positions, with an extreme protruding position for loading or changing blades at the cutting end of the



slider and a reverse extreme access position for inserting and removing extra blades from a blade storage chamber at the opposite end of the slider.

3,708,882
DENTAL ARTICULATOR ACCESSORY
Niles F. Guichet, 320 Olympia Place, Anaheim, Calif.
Filed Dec. 10, 1970, Ser. No. 96,906
Int. Cl. A61c *11/00*
U.S. Cl. 32—32 **13 Claims**

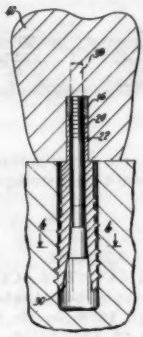


Dental supports for clutches in an articulator are described which are used to facilitate the mounting of the clutches and their dependent dental instruments in an articulator. The supports comprise a base member which is removably attached to the dental cast support screw of each articulator frame member with a telescoping member that bears a clutch support plate and that can be locked to the base member at any desired extension therein. The supports are used when the adjustable fossa and incisal guides of the articulator are to be set to duplicate a paitent's border mandibular movements. In this method, a pantograph with attached clutches is positioned in the articulator in the proper anatomical relationship to the articulator control surfaces. The clutch support plates of the accessory of this invention are then extended from their base members into proximate positions to their respective clutches, a curable plastic is placed between the clutches and the support plates, and the articulator is maintained in its centric position until the plastic cements the clutches to their support plates.

3,708,883
DENTAL IMPLANT AND METHOD FOR USING THE SAME
Stanley Flander, 77-10 34th Avenue, Jackson Heights, N.Y.
Filed Jan. 4, 1971, Ser. No. 103,605
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 A **8 Claims**

A dental implant which has an elongated tubular body provided with an outer anchoring portion and an inner portion adapted to be situated within a bone bore. The body has a pair of extensions projecting from its inner portion inwardly along the interior of the bone bore and provided with exterior projections, these extensions being spreadable for pressing the projections into the bone at the bore thereof. An elongated spreader screw extends through the tubular body and has a wedge-shaped spreader end situated between the extensions.

A nut mounted on the outer end of the tubular body is threaded onto the screw to pull the latter outwardly so that the spreader end portion will spread the extensions apart from



each other to press the exterior projections into the bone. The part of the screw and an artificial tooth is anchored to the nut as well as the outer portion of the tubular body which projects beyond the gum line.

3,708,884

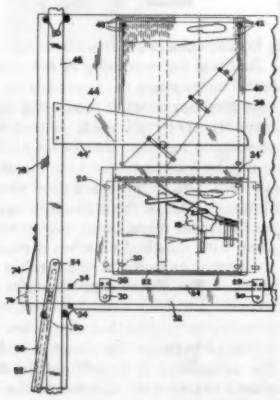
METHOD AND APPARATUS FOR MAKING STEREOSCOPIC DRAWINGS

Luis A. Turner, 8406 S.W. 58th Avenue, Portland, Oreg.

Filed Nov. 13, 1970, Ser. No. 89,268

Int. Cl. B43l *13/18*

U.S. Cl. 33—20 R **15 Claims**



Stereoscopic drawings are made by arranging master plan and front view drawing in spaced, longitudinal alignment, mounting a tracing sheet over the master front view drawing for lateral movement relative thereto, tracing on the tracing sheet each point on the master front view drawing that lies on a selected reference line extending longitudinally between corresponding points on both master drawings, moving the tracing sheet laterally from the reference line a distance proportional to the distance from a point on the master plan view drawing lying on the reference line to another point on the master plan view drawing displaced longitudinally from the reference line point, tracing on the tracing sheet each point on the master front view drawing that lies on the longitudinal line extending through said other point on the master plan view drawing, and repeating the moving and subsequent tracing steps for other longitudinally displaced points on the master plan view drawing. Related spaced points thus traced then are interconnected by free-hand or instrumented drawing. The tracing sheet then is displaced laterally from the master front view drawing and both are viewed through a stereoscope to ascertain the completeness and accuracy of the tracing sheet drawing and correspondence of character with the master front view drawing. Apparatus for performing the foregoing method includes a drawing support for the master drawings, an open framework support for the tracing sheet mounted for lateral movement relative to the master front view drawing, a straight edge mounted for movement longitudinally relative to the master plan view drawing and adjustable cam means interconnecting the framework support and straight edge for simultaneous proportional movement. A stereoscope also is mounted above the drawing support for use in viewing both master front view drawing and tracing drawing when said drawings are displaced laterally relative to each other.

3,708,885

APPARATUS FOR MEASURING SHAFT SEALING RINGS HAVING AN ANNULAR SEALING LIP

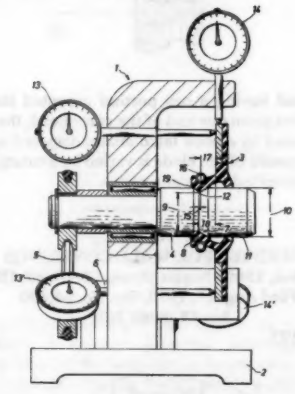
Karl Christ, D-5673 Burscheid, Germany, assignor to Goetzewerke Friedrich Goetze A.G., Burscheid, Germany

Filed April 1, 1971, Ser. No. 130,377

Claims priority, application Germany, April 7, 1970, P 20 16 436.7; Aug. 29, 1970, P 20 43 011.9

Int. Cl. G01b *5/00*

U.S. Cl. 33—174 L **11 Claims**



Apparatus for determining axial and radial dimensions of annular lip seals usable on shaft members, including a support structure for rotatably supporting a spindle over which a seal can be slipped, the prong having a circumferential groove shaped to conform to the contour of the sealing lip of the seal and the diameter of the bottom of this groove being equal to the diameter of the shaft for which the seal is designed. When the seal is slipped over the spindle the sealing lip snaps into the groove to assume a position as if mounted on a shaft for expected use. In this position calibrated gauges mounted on the support structure and having sensor portions adapted to contact face portions on the seal can be used to make the desired measurements.

3,708,886

LYOFLO-STOPPER

Robert W. Ogle, Newport Beach, Calif., assignor to Lyoflo-Stopper Corporation

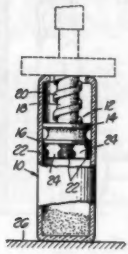
Division of Ser. No. 791,727, Jan. 16, 1969, Pat. No. 3,578,195. This application Nov. 9, 1970, Ser. No. 88,185

Int. Cl. F26b *5/06*

U.S. Cl. 34—5 **1 Claim**

This patent describes a novel resilient lyophilizing stopper for use in a vial or other medicament container having an open end, said stopper comprising an upper portion having one or more sealing rings adapted to form a seal on the inside walls of

said vial and act as a piston therein, and a lower portion comprising a series of interruptions around the periphery of the lower portion, said interruptions forming a force compression

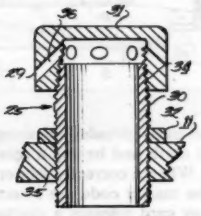


fit with the walls of the vial and the spaces between the interruptions being adapted to provide a gas passage from the interior of the vial to the exterior when said sealing rings are held beyond the end of the vial by said interruptions.

3,708,887
NOZZLES FOR FLUIDIZED BED VESSEL CONSTRUCTION PLATE

Maurice J. Erisman, Oak Park, Ill., assignor to FMC Corporation, San Jose, Calif.

Filed Sept. 8, 1970, Ser. No. 70,278
Int. Cl. F26b *3/16, 17/00*
U.S. Cl. 34—57 A **3 Claims**



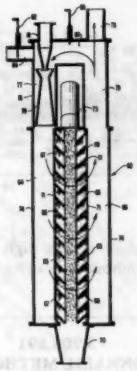
An improved nozzle is provided for the constriction plate in a fluidized bed type of heat transfer apparatus.

3,708,888
APPARATUS FOR ACTIVATING COMMINUTED MATERIAL

Maurice A. Trepanier, Marquette, Mich., assignor to Royal Oak Charcoal Company, Memphis, Tenn.

Filed Jan. 14, 1971, Ser. No. 106,417
Int. Cl. F26b *17/12*
U.S. Cl. 34—169 **10 Claims**

An apparatus for activating carbon or other comminuted material is described. The apparatus includes a plurality of baffles upon which the material to be activated impinges as it falls through the activating apparatus. The bottom surfaces of the baffles are spaced and configured to define passages for the activating gas. Accordingly, the flow of activating gas through the material is in the form of a plurality of congruent paths which appear as branches of the main gas flow. All the material is therefore exposed to gases having substantially equal activating capabilities and a uniform activation is achieved. The combustion gases, which are given off from the fuel used to heat the activator, are utilized as the activating

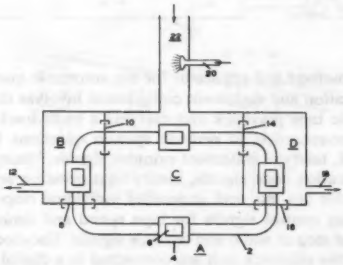


gases and a venturi is used to supply the activating gases to the activating chamber of the apparatus.

3,708,889
APPARATUS FOR BLEACHING FURNITURE

John W. Baymiller, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 28, 1970, Ser. No. 101,487
Int. Cl. B27k *5/02;* **F26b** *19/00*
U.S. Cl. 34—83 **1 Claim**



A method and apparatus is utilized for bleaching furniture through the use of hydrogen peroxide and ammonia. The furniture to be bleached is placed on a conveyer which passes through an air lock structure into an ammonia chamber. Ammonia is delivered to the ammonia chamber and causes the bleaching of the furniture. The bleached furniture component is removed from the ammonia chamber through an air lock structure.

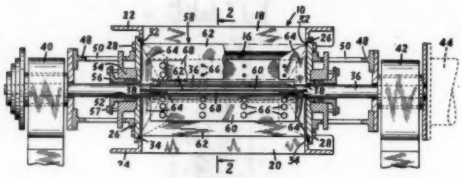
3,708,890
ROTARY AIR LOCK APPARATUS

Edward B. Weisselberg, Old Tappan, N.J., assignor to Wyssmont Company, Inc., Fort Lee, N.J.

Filed Feb. 5, 1970, Ser. No. 8,827
Int. Cl. B65g *53/40*
U.S. Cl. 34—242 **5 Claims**

Rotary air lock apparatus suitable for high temperature operation includes a generally cylindrical housing having opposed inlet and outlet openings, an elongated shaft journaled centrally within the housing and a plurality of flexible, segmented blades carried by the shaft for rotation within the housing. The blades are constructed to make sealing engagement with the inner cylindrical walls and end walls of the

housing, and to allow thermal expansion and contraction of the blades both axially and radially of the housing without impairment of the seal between the blades and the housing. Radi-



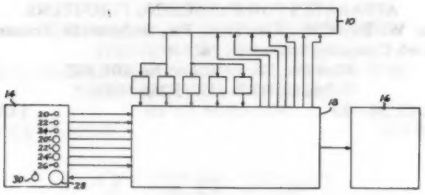
ant cooling of the shaft allows high temperature operation without requiring elaborate cooling systems for the shaft bearings.

3,708,891

SPOKEN QUESTIONNAIRE METHOD AND APPARATUS

Robert J. Rosov, Springfield, Oreg., assignor to Oregon Research Institute, Eugene, Oreg.

Filed Jan. 18, 1971, Ser. No. 107,219
Int. Cl. G09b 7/00
U.S. Cl. 35—9 A **3 Claims**



The method and apparatus for the automatic questionnaire presentation and statement compilation involves the use of a magnetic tape playback unit carrying a multi-track magnetic tape pre-recorded to provide spoken questions for an individual, teletype statement printout signals, binary question identification code signals, binary next question search code signals for yes, no, and undecided individual responses, and operating control signals for tape speed and timing and for start and stop of audio and teletype signals. The electrical outputs of the playback unit are connected to a digital logic control unit to which also is connected the electrical outputs of a patient response unit. The logic control unit is programmed to control the playback unit to select from a questionnaire on the tape questions corresponding to individual responses to previous questions, and to select from a plurality of modulating codes on the tape, each representing a statement, appropriate codes for modulating a teletype unit to provide printout of statements pertinent to the individual responses.

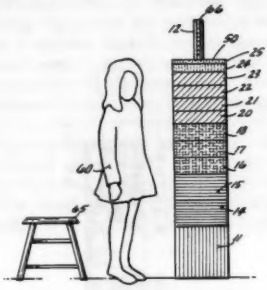
3,708,892

EDUCATIONAL DEVICE

Mary C. Graf, 506 Smith Avenue, Apt. 9A, Lake Bluff, Ill.

Filed Jan. 27, 1971, Ser. No. 110,031
Int. Cl. G09b 19/02
U.S. Cl. 35—31 D **10 Claims**

An educational device which teaches a child mathematical procedures, measurements and proportions including fractions as well as colors by permitting the child to visualize block members of varying dimensions and colors in relation to each other. A post element is secured to a base member and block members are constructed to be inserted on the post so as to permit the child to store the blocks and measure his own height in relation to the base and the block members. The post is detachable and has measuring indicia to allow the child to measure the blocks and the blocks are of varying colors some



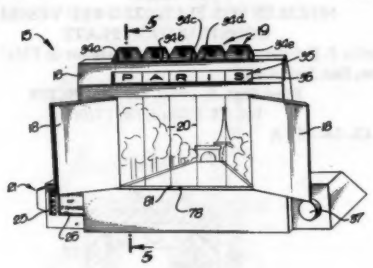
of which are arranged in sets to equal the base member so as to provide an understanding of fractional amounts.

3,708,893

EDUCATIONAL GAME

John Murphy, 4591 Round Top Drive, Los Angeles, Calif.

Filed Nov. 12, 1971, Ser. No. 198,262
Int. Cl. G09b 7/00
U.S. Cl. 35—9 D **21 Claims**



An educational game includes a housing having slots for insertion of coded cards and having a receptacle for a master coded key card. When a correctly sequenced subset of cards all coded like the master code are inserted, a circuit conditioned by the key card releases a shuttered window on the housing to expose a picture formed by the cards.

On each card, the position of a hole indicates the value of each coding parameter. The location of another hole indicates the card's sequence in the coded subset. The housing contains a set of electrical contact bars displaced laterally by the key card to set the contacts into positions indicative of the master coding. Only if the inserted cards match the master codes, in the correct sequence, will the holes be aligned with the contacts so as to complete an electrical circuit opening the shutter.

3,708,894

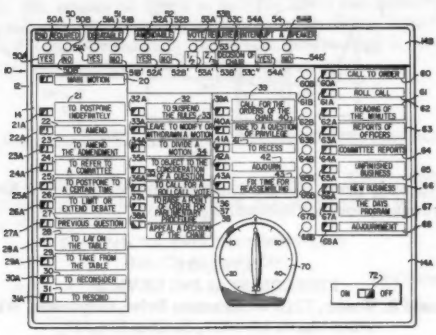
PARLIAMENTARY PROCEDURE GUIDE

Dana C. Savage, Jr., 333 E. 4th Street, Dover, Ohio

Filed Dec. 11, 1970, Ser. No. 97,117
Int. Cl. G09b 19/00
U.S. Cl. 35—21 **9 Claims**

An electrical parliamentary procedure guide device for aiding in the conducting of a meeting in accordance with established rules of parliamentary procedure. The face panel of the device includes a series of switches each representing parliamentary motions and a series of indicator lights which are selectively energized upon actuation of a "motion" switch to indicate the applicability of various considerations concerning the regulation of the disposition of the particular motion

associated with the actuated switch. For example, whether one or another of a pair of lights is energized upon actuation of a particular motion switch may indicate whether or not a second is required for that motion, whether the motion is



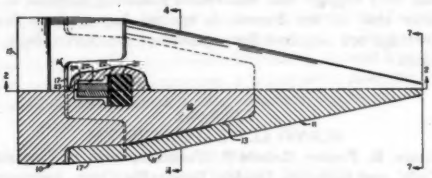
debatable and so on. A second series of lights and switches provides an indication of the part of meeting in progress as well as ensures that the meeting progresses in the prescribed order.

3,708,895

REPLACEABLE TOOTH ASSEMBLY

Norman N. Griffith, and John D. Hollingsworth, both of Jacksonville, Fla., assignors to Florida Machine & Foundry Co., Jacksonville, Fla.

Filed April 29, 1970, Ser. No. 32,969
Int. Cl. E02f *9/28*
U.S. Cl. 37—142 A **7 Claims**



A replacable tooth assembly including a tooth formed with a conical interior opening and flanges extending from the base of the opening. The conical opening is applied to a conical adaptor nose and the flanges hold the tooth against rotation on the nose by coaction with the base of the adaptor. A key in the nose extends into slots in the flanges to lock the tooth on the nose. Limit surfaces of the key coact with surfaces of the tooth adjacent the tooth slots to prevent inadvertent removal of the key except through forcible movement of the key laterally and axially of the nose.

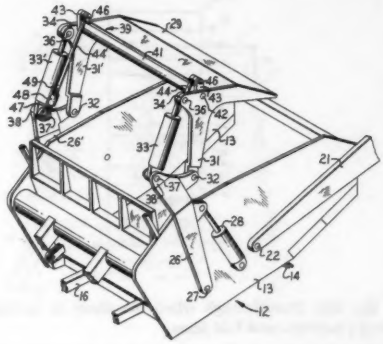
3,708,896

HOEING APRON MECHANISM WITH LOAD COMPENSATING TORSION BAR

Larry G. Eftefield, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed March 20, 1970, Ser. No. 21,369
Int. Cl. B60p *1/50*
U.S. Cl. 37—4 **8 Claims**

A scraper is provided with a manipulatable apron for drawing material into the bowl to assist loading as the scraper moves forward. The apron is pivoted to a pair of arms which are, in turn, pivoted to the bowl sidewalls and fluid cylinders provide for controlled flexing at each pivot joint. A torque tube extends along the top of the apron and is linked to both of the arms by struts to avoid the undesirable effects of unequal loading at the sides of the structure and to unitize the arms without requiring cross-bracing or other obstructions across the top of the bowl.

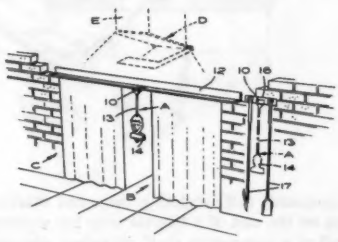


3,708,897

CLOSED-DAMPER INDICATOR FOR FIREPLACE

William J. Adams, and Eugene A. Ferrari, both of P.O. Box 806, Aptos, Calif.

Filed April 14, 1969, Ser. No. 815,987
Int. Cl. G09f *19/00*
U.S. Cl. 40—1 **3 Claims**



A closed-damper indicator for a fireplace having an anchoring member provided with a permanent magnet that may be removably secured to a metallic surface in the fire chamber of the fireplace, with a flexible connector having its upper end attached to the anchoring member so as to hang therefrom, and a telltale fixed to the lower end of the connector for visually indicating the fact that the damper of the fireplace has been closed.

3,708,898

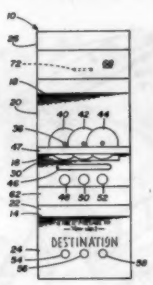
INDICATING DEVICE

Victor Wayland Cornelius, Eastland, Tex.

Filed Sept. 17, 1970, Ser. No. 72,916
Int. Cl. G09f *11/04*
U.S. Cl. 40—70 **6 Claims**

A resettable character indicating device is of the type, for example, usable in an automobile for recording mileage at a given time. A disclosed embodiment contains three windows or apertures for indicating the unit, tens and hundreds digits of mileage. The device is made from a single sheet of cardboard or the like which is punched at predetermined locations with apertures or holes for receiving an axle bearing member and character bearing discs. Certain of the apertures are located to

provide windows for display of the characters on the discs while other apertures are located to allow extension of an edge



of the disc therethrough when the sheet is carefully folded along prepositioned fold lines.

3,708,899

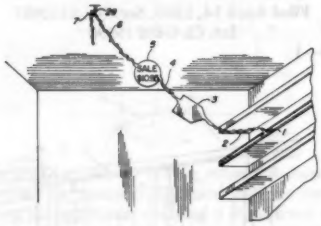
MOBILE PRICE-RAIL MARKER

Thomas L. Berry, Jr., Deerfield, Ill., assignor to Litho-Paint Poster Company, Chicago, Ill.

Filed Sept. 10, 1970, Ser. No. 71,153

Int. Cl. G09f 7/22

U.S. Cl. 40—128 **8 Claims**



An animated, self-oscillating price-rail marker, having a base tab on the end of a flexible strip for attachment to the price rail of a commodity shelf, including advertising display and direction indicating tags, and having means on the other end of the strip for hanging the display from a stationary support in special attention-getting spatial relationship before the commodity; the marker device having wiggle-waggle mobility for getting the attention of the passer-by, and having stretching motion for pointing-out the direction and location of a particular commodity of special sale, both of which are animated by air movements occurring in the environment.

3,708,900

AERIAL SIGN

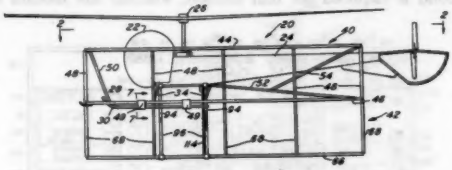
James G. Robinson, 2213 Oakwyn Road, Lafayette Hills, Pa.

Continuation-in-part of Ser. No. 76,897, Sept. 30, 1970, which is a continuation-in-part of Ser. No. 763,358, Sept. 30, 1968, abandoned. This application April 6, 1971, Ser. No. 131,619

Int. Cl. G09f 21/06

U.S. Cl. 40—212 **5 Claims**

A sign for use with aircraft. The sign comprises an upper portion and a lower portion. The upper portion is mounted on the side of the aircraft and is disposed generally above the landing gear. The lower portion is pivotally supported beneath the aircraft on the opposite side of the landing gear and in close proximity to the upper portion. The lower portion can be raised to a horizontal position where it is positioned in a generally horizontal plane between the landing gear so that the aircraft can land. When the lower portion is in its display position, the fact that the two portions are not in the same vertical plane is not discernible to the ordinary observer. Thus, a



continuous figure can be displayed on the upper and lower portions without any horizontal gaps in it.

3,708,901

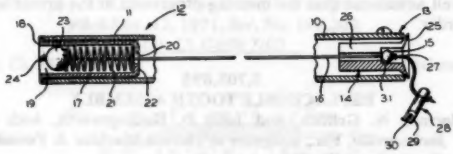
FIREARM SEALING DEVICE

Donald R. Wolter, 7216 W. Grantosa Drive, Milwaukee, Wis.

Filed March 15, 1971, Ser. No. 124,317

Int. Cl. F41c 27/08

U.S. Cl. 42—1 N **7 Claims**



A firearm is protected against unauthorized use and contamination with a kit that comprises an element which is resiliently biased into the chamber end of a gun barrel and which may engage with and retain a sealing element at the muzzle end of the barrel. A special key and particular knowledge are required for removal of the device from the firearm.

3,708,902

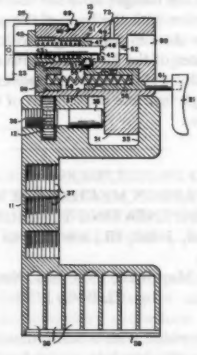
SURVIVAL WEAPON SYSTEM

Norman B. Foster; Robert P. Yeomans, both of Lancaster, Calif., and Robert A. Daniels, Bonneville, Oreg., assignors to Space-Age Control, Inc., Palmdale, Calif.

Filed Aug. 11, 1970, Ser. No. 62,911

Int. Cl. F41c 27/00, 3/02, 19/00

U.S. Cl. 42—1 R **14 Claims**



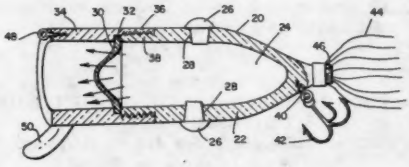
A compact, convertible weapon for use in survival environments includes a handle for selectively mounting a mechanism

for firing cartridges or flares thereon as well as having storage capability. The firing mechanism utilizes a ball and detent arrangement for cocking an associated bolt and includes a firing pin arrangement selectable for either rim- or center-fire cartridges. An associated barrel is partially rifled and partially smooth-bored for improved accuracy when firing certain types of loads. Alternatively, the handle may be used is conjunction with a knife attachment.

3,708,903
SELF-ILLUMINATING CHEMILUMINESCENT FISHING LURE

Christa V. Bercz, Oaklyn; Jolan S. Rozmanith, Cherry Hill, and Jeno P. Bercz, Oaklyn, all of N.J., assignors to Lurex, Inc., Cherry Hill, N.J.

Filed Feb. 12, 1971, Ser. No. 114,979
Int. Cl. A01k *85/00*
U.S. Cl. 43—17.6 **18 Claims**

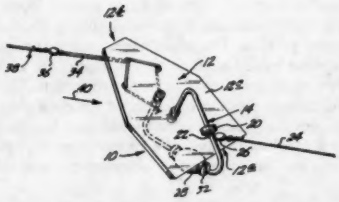


A self-illuminating fishing lure container having a cavity receiving chemiluminescent material and comprising a gas permeable member impervious to the chemiluminescent material for reducing pressure build-up within the cavity by gas diffusion. The gas permeable member may comprise a material softer than the adjacent members of the lure and may be held in place by a snap-action mechanism or clamped in place. The member which communicates with the exterior of the lure permits the escape of gases common to that of normal atmosphere while preventing pollution of environmental waters by the chemiluminescent material(s). At least a portion of the container may comprise a transparent material with preferred embodiments including an optical brightener.

3,708,904
FISHING LINE DIVING DEVICE

Edmond P. Zaharis, 5735 N.E. 33rd Avenue, Portland, Oreg.

Filed Feb. 10, 1971, Ser. No. 114,176
Int. Cl. A01k *85/00*
U.S. Cl. 43—43.13 **13 Claims**



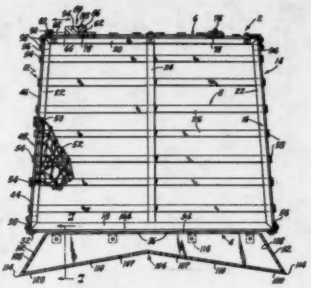
A fishing line diving device wherein the points of action (or force transmission) of a connected fishing line end, and of a weight included in the device, are infinitely adjustable.

3,708,905
PLASTIC LOBSTER TRAP

Donald A. Jalbert, 137 N.E. Washington, Bartlesville, Okla.

Filed Jan. 26, 1971, Ser. No. 109,768
Int. Cl. A01k *69/08*
U.S. Cl. 43—100 **9 Claims**

A lobster trap including a container formed by six planar panels, each comprising a plastic frame having spaced plastic strips mounted thereon. The top panel has a door therein, and the side panels are inclined and one thereof has a conventional lobster entrance means therein. A plurality of plastic ballast

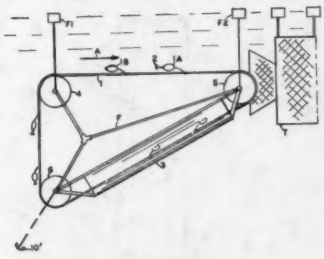


boxes are secured to the undersurface of the container, each having downwardly and outwardly pointing feet on the opposite ends thereof.

3,708,906
FISH ATTRACTING MEANS

Julian Stein, 338 Fairway Drive, Franklin Square, N.Y.

Filed Jan. 11, 1971, Ser. No. 105,473
Int. Cl. A01k *69/00*
U.S. Cl. 43—100 **12 Claims**



A recirculating cable on which is mounted a plurality of lures is mounted on a plurality of driven pulleys. The fish are attracted by the traveling lures into the area in front of the mouth of a fish trap or directly into a fish trap. The return path of the recirculating cable is covered with a shield to discourage fish from swimming away from the trap area. Various types of lures may be used.

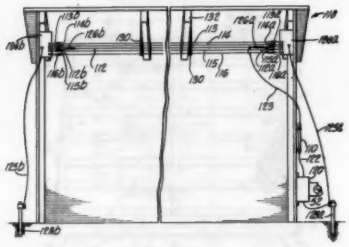
3,708,907
SHOCKING DEVICE

Jarold B. Cole, San Juan Capistrano, Calif., assignor to Harry Lime Industries, Anaheim, Calif.

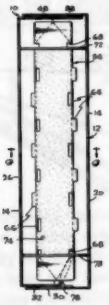
Filed Jan. 28, 1971, Ser. No. 110,450
Int. Cl. A01m *1/22*
U.S. Cl. 43—112 **13 Claims**

Current is periodically supplied to a step-up transformer by means of a series of clock-actuated relay switches. A first conductor wire is connected at one end through a neon tube to one terminal of the secondary coil of the transformer and is insulated from ground at the other end. Four grounded conductor wires are secured parallel to and in spaced relation with the first conductor. The voltage between the first conductor and the grounded conductor wires is slightly below the breakdown voltage for the air gap spacing between the first conductor and the grounded wires. Insects flying between the first

conductor and any one of the ground wires will shorten the air gap and, when power is being supplied to the transformer, provide a short between ground and the first conductor. Such insects will be shocked.



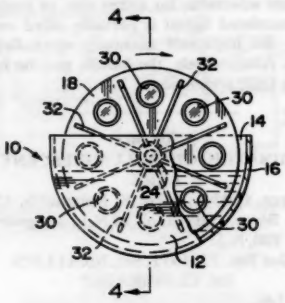
3,708,908
INSECT TRAP
John S. Levey, Los Angeles, Calif., assignor to Days-Ease Home Products Corporation, Hollywood, Calif.
Filed June 22, 1970, Ser. No. 48,153
Int. Cl. A01m *01/14*
U.S. Cl. 43—114 **23 Claims**



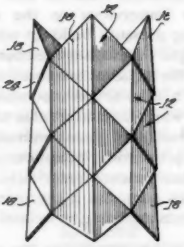
The insect trap has a tubular, perforated housing which serves as a receptacle for an inner tubular structure which is an insect attractor and catcher. In the preferred embodiment, the inner tubular structure is also perforated and carries a sticky surface on the exterior thereof for capturing insects and an odor-emitting attractant on the interior for emitting an attractive odor through the perforations. In another embodiment, the odor-emitting attractant may be incorporated into the sticky insect-capturing material and coated on the outside of the inner tubular insert.

3,708,909
BUBBLE PRODUCING TOY
Emanuel A. Winston, 2925 W. Touhy, Chicago, Ill.
Filed Nov. 18, 1969, Ser. No. 877,682
Int. Cl. A63h *33/28*
U.S. Cl. 46—7 **6 Claims**

A bubble producing toy which has a rotatably mounted apertured disc in which some of the apertures are submerged within a bubble producing solution. The apertured disc is provided with vanes which cause the disc to rotate in response to pneumatic pressure being applied. The same pneumatic pressure is utilized to form the bubbles.



3,708,910
METHOD OF STACKING NESTING ARTICLES OF DIMINISHING SIZE
Jack J. Skillman, 727 E. 60th Street, Apt. 1616, Chicago, Ill.
Filed Nov. 5, 1970, Ser. No. 87,180
Int. Cl. A63h *33/06*
U.S. Cl. 46—17 **1 Claim**

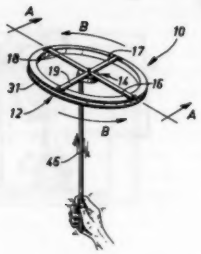


A method of stacking a toy or educational device comprising a plurality of members capable of being nested together to form a compact stack or of being positioned on top of one another to form an extended stack. The members are of progressively diminishing sizes. Each consists of a central portion having a plurality of triangularly shaped interconnected sections and a plurality of triangularly shaped interconnected outer segments connected to the triangularly shaped sections of the central portion. The outer segments cooperate with the central portion upper surface to form pockets and with the central portion undersurface to form projections. Each pocket is adapted to receive a projection of an overlying adjacent member when the members are in compact stacked relation. In extended stacked relation the projections of the overlying member rest at the junctions of adjacent pockets of member beneath.

3,708,911
RECREATIONAL DEVICE
Leo Haschek, 140 Close Avenue, Toronto, 146 Ontario, Canada
Filed July 12, 1971, Ser. No. 161,764
Int. Cl. A63h *33/02*
U.S. Cl. 46—47 **6 Claims**

A recreational device includes an outer hoop to which a generally axially disposed hub is secured by radial spokes. The hub includes a discoid portion and a generally cylindrical wall defining a recess so that the device can be spun on the tip of a

stick. An axial hole in the hub allows two of the devices to be mounted on a shaft to provide a pair of wheels while, by detaching the hub and the spokes from the hoop, the device is converted into a conventional trundling hoop. By the use of



generally trapezoidal vanes having airfoil configurations as the spokes, the device can be caused to fly through the air when spun from the tip of a stick or, by inverting the device, it tends to remain on the tip of such a stick when it is spun thereon.

3,708,912

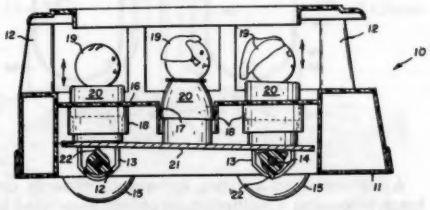
BOUNCING PASSENGER VEHICLE TOY

Walter P. Doe, East Aurora, N.Y., assignor to The Quaker Oats Company

Filed March 1, 1971, Ser. No. 119,624

Int. Cl. A63h *5/00*

U.S. Cl. 46—204 **3 Claims**



Simulated passengers in a toy vehicle are made to bounce as the vehicle rolls along. A chassis supported by wheeled axles with through openings for receiving the passengers which rest on a loose plate beneath the platform. The plate is driven vertically by multi-lobed cams on the vehicle axles as the vehicle rolls along, and this bounces the passengers.

3,708,913

TOY MOTORCYCLE

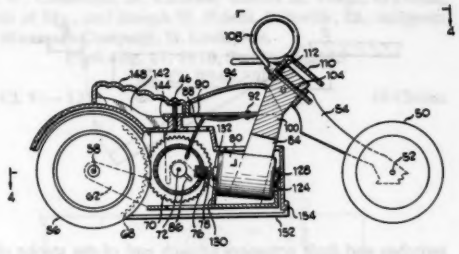
Reuben Terzian, Chicago; Robert S. McKay, Morton Grove, and Marvin I. Glass, Chicago, all of Ill., assignors to Marvin Glass & Associates

Filed Feb. 8, 1971, Ser. No. 113,300

Int. Cl. A63h *33/26*

U.S. Cl. 46—243 LV **15 Claims**

A two-wheeled toy vehicle including a wheel drive motor and capable of maintaining an upright position during operation without the assistance of a third wheel or the like. The exemplary embodiment is configured in the form of a motorcycle and includes an electric drive motor and batteries therefor located below the axis of rotation of the wheels to provide the vehicle with an extremely low center of gravity thereby enhancing its stability during operation. The vehicle can be operated as a free running vehicle or, in the alternative, can be provided with a tether of variable length and with a variable



speed control, both of which can be controlled by a user during operation of the vehicle.

3,708,914

HATCH COVER DRIVE MEANS

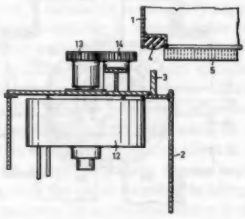
Bo Kent Ansund, Goteborg, Sweden, assignor to MacGregor International S.A., Basel, Switzerland

Filed Oct. 12, 1971, Ser. No. 188,285

Claims priority, application Sweden, Oct. 16, 1970, 13993/70

Int. Cl. B63b *19/18*; E05f *15/14*

U.S. Cl. 49—209 **5 Claims**



In a drive means for hatch covers of the type in which hatch cover sections are movable laterally or longitudinally by means of a rack arranged beneath the hatch cover section, said rack co-operating with a drive motor located externally of the hatch coaming, the improvement that the drive means includes two pinions, one of which in the closed position of the hatch cover engages a rack element on the outside of the hatch cover section, while the other pinion is arranged to coact with the rack subsequent to a limited movement of said hatch cover section, and which rack extends at most to a hatch packing inserted in the lower surface of the hatch cover section.

3,708,915

APPARATUS FOR OPERATING SWING DOORS

Anthony Walter Davey, Hathern, England, assignor to Herbert Morris Limited, Loughborough, Leicester County, England

Filed Jan. 25, 1971, Ser. No. 109,166

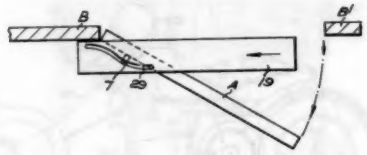
Claims priority, application Great Britain, Feb. 6, 1970, 5,785/70

Int. Cl. E05f *15/00*

U.S. Cl. 49—340 **8 Claims**

Apparatus for operating swing doors or other members through a predetermined angle in which one member of a linear motor is mounted on a stationary frame extending horizontally above the door, a pin or roller on the door engag-

ing a slot in the moving member of the motor to pivot the door from an open to a closed position and visa versa with limit



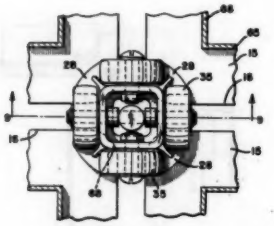
switches and limit actuators at each end of the stroke of the moving member to cut off and reverse the motor.

3,708,916

MOVABLE WALL PANEL SYSTEMS

Joseph G. Karp, Jr., and Robert F. McCurdy, both of New Castle, Ind., assignors to American Standard Inc., New York, N.Y.

Filed April 23, 1971, Ser. No. 136,811
Int. Cl. E05d *13/02*
U.S. Cl. 49—409 **4 Claims**



Trolleys for movable wall panels are particularly adapted to negotiate track intersections, turns, and parallel track stacking intersections. The trolley body is formed with a support surface positioned slightly above the rolling contact surface of the trolley wheels. The support surface permits sliding movement of the trolley through the intersection gap while preventing the trolley wheels from falling into the track slot. In one embodiment, four trolley wheels are positioned mutually at right angles with the support surface in the arcuate spaces between the wheels. In another embodiment, two trolley wheels in combination with centering and guide rollers are combined with a support plate, which plate carries a layer of low-friction material.

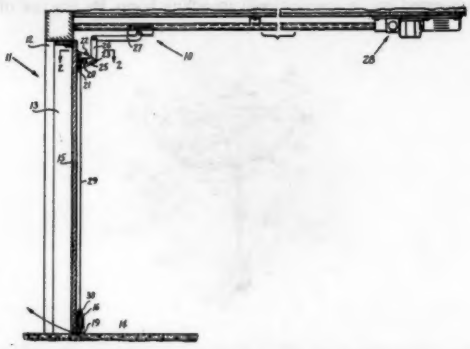
3,708,917

LOCKING DEVICE FOR OVERHEAD GARAGE DOOR

Paul W. Streeter, 111 Los Gatos, Vallejo, Calif.

Filed Feb. 2, 1971, Ser. No. 111,822
Int. Cl. E05f *15/00*
U.S. Cl. 49—280 **1 Claim**

In a motor operated overhead garage door the operator is connected to a bell-crank lever pivotally mounted on the garage door so that the first movement of the operator swings the bell-crank lever to retract a spring pressed locking device



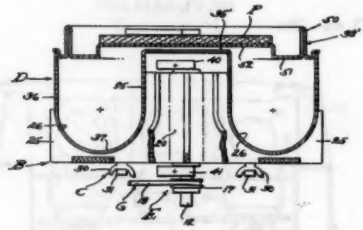
for locking the door in closed position. Further movement of the operator lifts the door in a conventional manner.

3,708,918

AGITATOR FOR MOVING FLUID SUSPENDED OBJECTS THROUGH ABRASIVE MOTIONS

Clarence Pool, 8321 Possons Boulevard, Pico Rivers, Calif.

Filed Nov. 12, 1969, Ser. No. 875,686
Int. Cl. B24b *7/00*
U.S. Cl. 51—3 **5 Claims**



A self-contained agitating apparatus, primarily useful for batch processing a multiplicity of objects suspended in a fluid and contained in a vessel that is oscillated by a remote and stationary prime mover, to cause said objects to progressively move through a toroidal path and thereby roll into and out of interengagement and into and out of engagement with the vessel walls, and which action is enhanced by the presence of abrasives added to the fluid and/or batch for the purpose of deburring, polishing and the like. Secondarily, the apparatus is useful for lapping objects upon a plate and by means of the above said oscillatory action, said secondary utility being concurrent with said primary utility and operative simultaneously in the one apparatus.

3,708,919

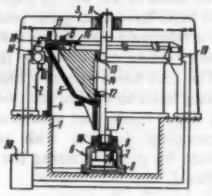
DEVICE FOR LAPPING TAPERED MATING SURFACES OF PARTS

Alexei Ilich Isaev, Moscow; Semen Albertovich Pevzner, Kramatorsk Donetskoi oblasti, and Jury Semenovich Zemtsov, Orsk Orenburgskoi oblasti, all of U.S.S.R., assignors to Kramatorsky Nauchno-Issledovatelsky i Proektno-tekhnologichesky institut mashinostroenia, Kramatorsk, Donetskoi oblasti, U.S.S.R.

Filed Nov. 18, 1970, Ser. No. 90,518
Int. Cl. B24b *15/08*
U.S. Cl. 51—26 **6 Claims**

Apparatus for lapping the tapered mating surfaces of parts, mainly bells and cups of blast furnace charging devices, and

for ensuring accurate orientation in space of the parts during lapping and control of the load in the lapping contact zone. A cup is held rigidly on a stand while a bell in inserted into the cup with a thin layer of abrasive compound between the mating parts. The bell is then given a reciprocating-rotary lapping motion and occasionally, momentarily raised to slightly separate mating contact so as to ensure reorientation of abrasive grains, improve lapping efficiency and reduce lapped surface roughness.

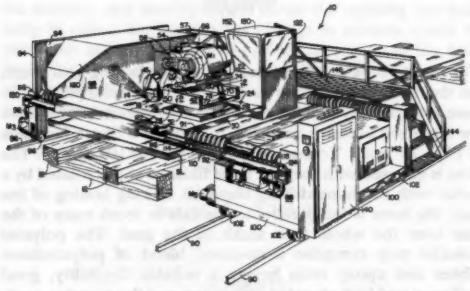


3,708,920

GRINDING MACHINE

Robert J. Kaszuba, Chicago, Ill., assignor to Pettibone Corporation, Chicago, Ill.

Filed Nov. 18, 1970, Ser. No. 90,749
Int. Cl. B24b 7/02, 27/04
U.S. Cl. 51—32 **7 Claims**



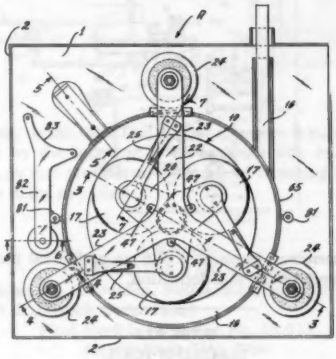
A grinding machine for conditioning the surfaces of steel slabs, billets, or the like to remove scale, exposed or hidden cracks and other surface irregularities. The entire grinding machine including the grinding wheel head and its supporting carriage travels on rails so that the grinding wheel may traverse the work. A rotary turret pivottally supports the boom housing for fore and aft rocking movements, and the grinding head is carried at the outer end of a relatively short boom which is fixed to and projects outwardly from the housing so that controlled angular movements of the turret will swing the grinding head and its associated grinding wheel over the surface of the work in order that the rotating grinding wheel may be shifted to an angular position wherein the grinding direction at the periphery of the wheel matches or nearly matches the longitudinal direction of any surface cracks which are undergoing spot eradication. The operator's control cab is positioned on the movable grinding machine carriage at a location where the grinding head is clearly and closely visible at all times.

3,708,921

APPARATUS AND PROCESS FOR POLISHING SEMICONDUCTOR OR SIMILAR MATERIALS

Paul W. Cronkhite, St. Charles; Robert D. Voege, O'Fallon, both of Mo., and Joseph W. Poletti, Belleville, Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 17, 1970, Ser. No. 64,165
Int. Cl. B24b 7/04
U.S. Cl. 51—131 **18 Claims**



In an apparatus for polishing semiconductor material, such as that in wafer form, a turntable is rotatably supported upon a framework, and said turntable is disposed for receiving in a polishing relationship a plurality of hubs, each of which hub is associated with a spindle, with all of said spindles being connected to a relatively free-floating, force distributing plate member; the rotation of said turntable effectively polishing the hub retained wafers, and causing each of said hubs to rotate itself about its own central axis incident to the revolving of said turntable. A height adjusting means supports a force exerting means against the plate member holding the spindles, so that a precise quantity of controlled force is directed upon said hubs during a polishing operation, and tension straps interconnect between said adjustment means and the spindles to retard the simultaneous turning of said spindles and hubs about the center of said turntable, and also eliminate any distorting or tilting forces that are detrimental to uniform and even polishing. Various locating means and guide means are provided in the apparatus to assist in the precise locating of the hubs upon the turntable as during set up, so that said hubs will be in proper alignment with their respective spindles.

3,708,922

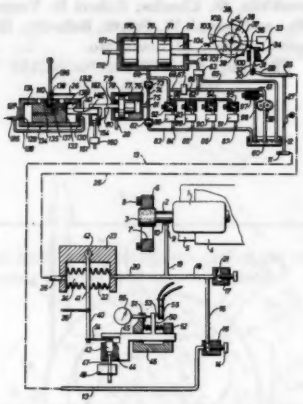
DEVICE IN GRINDING MACHINES

Gerszon Gluchowicz, Djursholm, Sweden, assignor to ABUVA, Stockholm-Bromma, Sweden

Filed June 19, 1970, Ser. No. 47,828
Int. Cl. B24b 49/02
U.S. Cl. 51—165.92 **6 Claims**

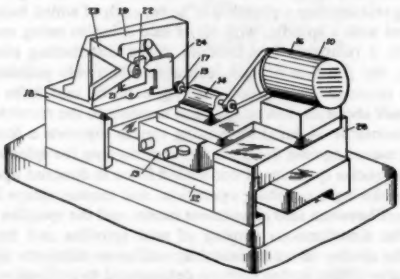
A grinding machine includes means for controlling the grinding member so as to allow a grinding operation with a considerable pressure between the grinding member and the work piece up to a predetermined movement of the grinding member corresponding to a predetermined removal of material, to obtain greatest possible removal of material within a minimum interval of time. The control means is arranged to take into account the deflection of the spindle carrying the

grinding member and to interrupt the feeding movement of the grinding member when the total movement corresponds to



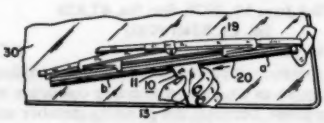
the predetermined movement plus an additional movement, which depends on the said deflection.

3,708,923
MACHINE TOOL
David H. Youden, Worcester, Mass., assignor to The Heald Machine Company, Worcester, Mass.
Filed May 22, 1970, Ser. No. 39,620
Int. Cl. B24b *41/02*
U.S. Cl. 51—165.93 **7 Claims**



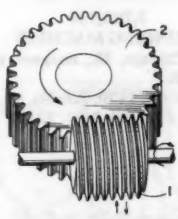
This invention relates to a machine tool and, more particularly, to apparatus making use of hydrostatic bearings in the guide ways.

3,708,924
WINDSHIELD BLADE RECONDITIONER
John Prunchak, 1013 Wymore Street, Pittsburgh, Pa.
Filed March 22, 1971, Ser. No. 126,849
Int. Cl. B24d *5/00, 7/00, 15/00*
U.S. Cl. 51—205 R **10 Claims**



A hand tool of pocket size is provided for cleaning and reconditioning the wiping edge portion of a resin or rubberlike wiping blade for windows, such as of a motor vehicle. The tool has a rigid operating head of abrasive-lined surface V-shape that is adapted to be moved along the wiping edge portion of a blade to remove adherent road grime, alkali metal scum, etc. The construction is such that highly adherent soaplike materials are removed with an abrasive-scraping relative movement of the operating head along the feather wiping edge and adjacent side portions or faces of the wiping edge portion of the blade; the sides of the head have an angular relation such as to support the blade in a relatively straight or unbent or folded-over shape during the cleaning movement of the tool longitudinally therealong. The tool has a gripping handle that is angled from the operating head to enable the operator to easily condition or clean a wiper blade that is in position in a substantially planar operating position with respect to the windshield of a vehicle by merely raising the blade slightly away from the windshield.

3,708,925
SCREW-SHAPED GEAR HONE AND METHOD OF FORMING AND USING THE SAME
Masato Ainoura, Kitashigeyasu-machi, Japan, assignor to Tsukihoshi Gomu Kabushiki Kaisha, Kurume-shi and Kabushiki Kaisha Kashifuji Tekkosho, Kyoto-shi, Japan
Filed Sept. 24, 1970, Ser. No. 74,973
Claims priority, application Japan, Sept. 30, 1969, 44/78361
Int. Cl. B24d *5/02*; B24b *19/00*
U.S. Cl. 51—206 P **3 Claims**

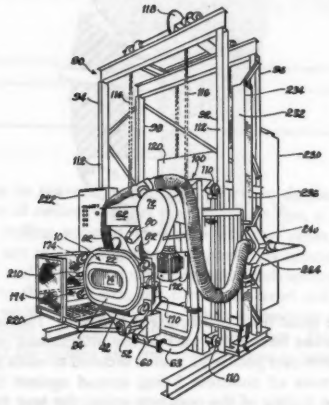


A worm-shape or screw-shape hone, for honing gear teeth, has the tooth profile of the basic rack at its normal plane. The hone is formed by molding synthetic polymers in which there are dispersed abrasive particles, to provide a Shore hardness of 15° – 75° and a Young's modulus $0.5 - 70 \times 10^3$ kg/cm². The hone is engaged with the gear to be finished and is rotated by a motor with the hone driving the gear. During honing of the gear, the hone is fed parallel to the axis or tooth trace of the gear over the whole face width of the gear. The polymer material may comprise a co-cured blend of polyurethane rubber and epoxy resin having a suitable flexibility, good resiliency and high abrasion resistance, and the abrasive particles may comprise Alundum or Carborundum, the abrasive particles being exposed at the working surface of the hone.

3,708,926
DUST COLLECTOR FOR USE WITH VERTICALLY MOVABLE DUST GENERATORS
James W. Fogle, Walkerton, Ind., assignor to The Wheelabrator Corporation, Mishawaka, Ind.
Division of Ser. No. 703,397, Feb. 6, 1968, Pat. No. 3,566,543. This application Dec. 2, 1970, Ser. No. 94,241
Int. Cl. B24b *55/06*
U.S. Cl. 51—273 **3 Claims**

A machine and method for treatment of vertically disposed surfaces of large dimension with dry particulate material comprising means for throwing the dry particulate material at high velocity in the direction toward said surface, a housing enclosing said throwing means having an opening through which the particulate material is thrown against said surface, means for establishing a sealing relationship about said opening between

the housing and said surface to confine the particulate material, dirt and dusts within the sealed space, means for collecting the spent particulate material at the bottom portion of the housing and for introducing air into the housing for air washing the spent particulate material to remove dirt and dusts, recycling the washed particulate material for feed to the throwing means, a dust collector for receiving the dirt and dust from within the housing for separation thereof and means for maintaining subatmospheric conditions within the housing to guide the air flow through the housing and about said sealing means to minimize the exhaust of dirt and dust into the atmosphere and in which the support means for said housing in-



cludes means for movement of the housing in the vertical direction, means for movement of the housing in the horizontal direction and means for movement of the housing in the direction toward and away from the surface and means for mounting the housing for rocking movement about its pitch and yaw axes to adjust the housing with change in contour of the surface, and sensing means about the opening automatically to adjust the housing for change in contour about the pitch axis and/or the yaw axis and for movement of the housing in the direction towards and away from the surface and for abutting off the feed of particulate material in the absence of a sealing relationship between the housing and surface.

ERRATUM

For Class 51—310 see:
Patent No. 3,708,936

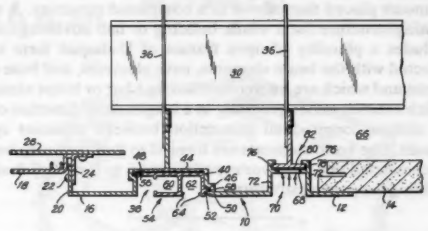
3,708,927

EXTRUSIONS FOR CARRYING CEILING TILES AND WINDOW CURTAINS, SHADES, AND THE LIKE

Seymour Cohen, 21 Newport Drive, Plainview, N.Y.

Continuation-in-part of Ser. No. 57,066, July 22, 1970. This application Feb. 19, 1971, Ser. No. 117,002
Int. Cl. G09f 7/18
U.S. Cl. 52—39 **11 Claims**

A structure to be used in buildings or the like for supporting ceiling tiles as well as for supporting window curtains, shades, or the like. An elongated extrusion has at its upper surface structure for supporting the extrusion in a horizontal attitude from a suitable beam or the like with the extrusion having an inner side edge region adapted to support ceiling tiles and an outer side edge region adapted to be located next to an upper frame member situated over a window. Between its side edge regions the extrusion is provided with a downwardly directed hollow channel defined by vertical wall portions of the extrusion and an upper horizontal wall portion extending between the vertical wall portions. These vertical wall portions are respectively formed with grooves extending parallel to each other longitudinally of the extrusion and communicating with the interior of the channel. These grooves are adapted to receive opposed side edges of a carrier structure situated in the channel for carrying units such as window curtains, Venetian blinds, or the like. This carrier structure is supported exclusively by the location of its opposed side edges in the grooves, so that there is no necessity of fastening the carrier structure to the extrusion.

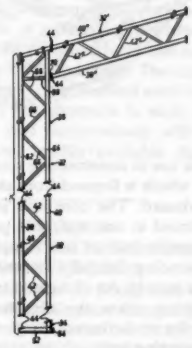


3,708,928

SUPPORTING STRUCTURE

Gunter Gaspers, Obwalden, Switzerland, assignor to Conrad Kern A.G., Zurich, Switzerland

Filed April 2, 1970, Ser. No. 25,013
Int. Cl. E04b 7/16, 7/06
U.S. Cl. 52—90 **8 Claims**



A supporting structure is made up of a plurality of different structural elements or trusses each of which includes flanges which, for example, may be oriented in a vertical plane or in an oblique plane so that the individual elements may be interconnected to form a supporting structure for example, for buildings, halls, sheds or the like. The individual supporting elements include a truss adapted for use as a beam element which may be arranged in a completed structure as a cross member or beam, or as a vertical member or end support. The beam element includes two spaced apart chords which may be arranged for example, in parallel relationship and which include flanges at each end which are advantageously arranged so that the flange connecting face of the two spaced apart members are oriented at the respective ends in a common plane. The structural elements also include a truss adapted for use as a column, eave or edge element which comprises spaced chord members which are interconnected by suitable bracing struts which hold them in a defined orientation, for example, in spaced parallel relationship. The upper end of this member advantageously includes an obliquely extending or horizontally extending cross beam element which together with a lower cross beam strut member terminate in flanges in a vertical plane to facilitate the juncture of the eave member to a connecting cross beam member having flanges at the con-

necting end which are oriented in the same vertical plane. In addition to the eave elements and the beam elements there is also provided a base element having a lower portion which defines either a horizontal flat supporting base or a wheeled supporting structure. The base element also includes flanges oriented in a plane for connection to one or more of the beam elements placed thereabove in a completed structure. A supporting structure for a whole building or hall advantageously includes a plurality of open frames of U-shaped form constructed with the beam elements, eave elements, and base elements and which are interconnected by a bar or brace element which extends either generally in a longitudinal direction or in an oblique longitudinal orientation between adjacent open frames. The basic elements are formed so that they may be interconnected in a large variety of manners to form any desired building supporting structure.

3,708,929

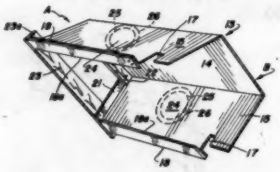
CAST IN SITU DECK CONSTRUCTION AND CORE UNIT FOR USE THEREIN

Timothy K. Estes; Frank G. V. De Winter, both of Grand Rapids, Mich.; John L. Doss, Lake Bluff, Ill., and James J. Higgins, East Grand Rapids, Mich., assignors to Packaging Corporation of America, Evanston, Ill.

Filed July 29, 1971, Ser. No. 167,183

Int. Cl. E04b *1/16, 5/36*

U.S. Cl. 52—98 **19 Claims**



A core unit for use in constructing a cast in situ deck or the like is provided which is formed from sheet material, such as laminated paperboard. The core unit includes an elongated top panel reinforced at one end, side panels depending outwardly from opposite sides of said top panels, and reinforced base panels extending laterally outwardly from the lower edges of the side panels. An elongated transversely extending reinforcing member spans the distance between the base panels and has the ends thereof projecting beyond the side panels. The projecting ends of the reinforcing member are adapted to interlock with an end of a second core unit of like construction arranged in overlapping end-to-end relation therewith.

3,708,930

SWIMMING POOL SEAL STRUCTURE

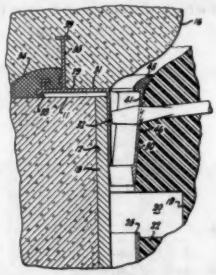
William J. Stegmeier, 1919 Ygnacio Valley Road, Apt. 66, Walnut Creek, Calif.

Division of Ser. No. 819,173, April 25, 1969, Pat. No. 3,605,357, which is a continuation-in-part of Ser. No. 761,726, Sept. 23, 1968. This application June 21, 1971, Ser. No. 154,865

Int. Cl. F04b *1/41;* **E04f** *15/14*

U.S. Cl. 52—98 **9 Claims**

A seal or water stop structure for use along a concrete coping at the upper edge of a swimming pool and a method of molding such coping utilizing the seal structure. The seal structure includes an elongated seal component forming a permanent part of such swimming pool, and which component has a barrier element interposed between the upper edges of the pool and concrete coping overlying the same. The seal structure further includes a tear strip component frangibly attached to the seal component along a line of weakness for separation therefrom with a mold form after the concrete coping has been constructed. In the method of molding concrete coping, the side walls of the pool are first covered with tile or other water-impervious finish, and a disposable mold form having a surface portion thereof configurated in the finished shape to be imposed thereby upon the coping and having also an attachment portion equipped with a double-faced pressure-sensitive tape is secured by means of such tape to the finished surface of the pool walls with the configurated surface portions of the mold form projecting thereabove. The seal structure is inserted between a part of the attachment portion of the mold form and pool wall, and is secured to each prior to a moldable mass of concrete being spread against the mold form. Upon curing of the concrete mass, the tear strip component of the seal structure is separated from the seal component thereof along such line of weakness, and such separation of the tear strip component is effective to strip the mold form from the pool walls and coping.



3,708,931

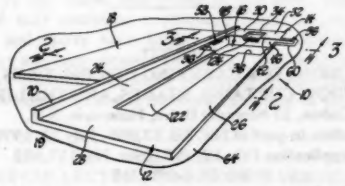
MOBILE HOME PAD CONSTRUCTION

Aaron Russell Button, 44109 Grand River, Novi, Mich.

Filed July 15, 1970, Ser. No. 55,047

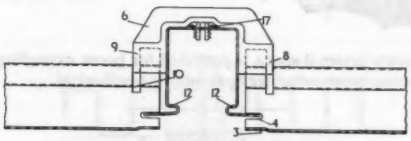
Int. Cl. E02d *27/32*

U.S. Cl. 52—169 **2 Claims**



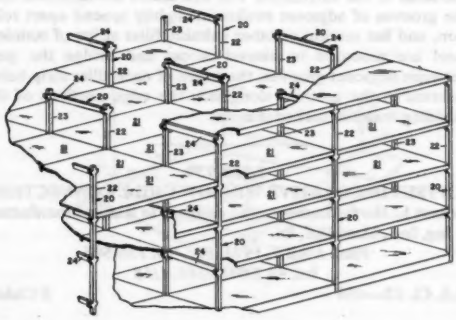
A mobile home pad includes poured concrete forward and aft spaced pad sections each of which includes ribbon-like lane portions permitting the mobile home to be driven over such lanes in the process of properly locating the mobile home with respect to the pad; a downwardly extending well separates the pad sections and permits the wheels and associated suspension system of the mobile home to be lowered into the well at which time suitable supporting and shimming blocks are placed along the lanes and beneath the mobile home undercarriage in order to level and support the mobile home on the pad.

3,708,932
CEILING SYSTEM
Malcolm Bailey, Alresford, and John Colin Downer, Chandler's Ford, both of England, assignors to Conder International Limited, Winchester, Hampshire, England
Filed June 3, 1970, Ser. No. 43,130
Claims priority, application Great Britain, June 4, 1969, 28,207/69
Int. Cl. E04c *2/00*
U.S. Cl. 52—232 17 Claims



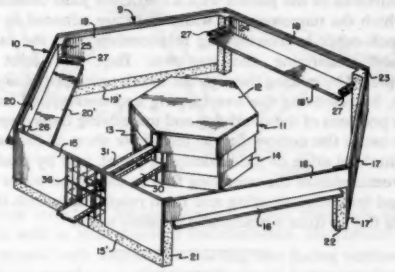
In order to prevent buckling or excessive displacement or deflection of ceiling support members in a fire, a gap is left between ceiling support members but the ceiling support members are secured together and positively spaced apart by a spacing and supporting arrangement which includes fusible material so that in a fire, the fusible material will melt and allow the width of the gap to alter while at least one of the support members remains supported on the other. This prevents collapse of the ceiling and improves the fire resistance of the building.

3,708,933
DEMOUNTABLE GARAGE BUILDING
Yue-Chyou Yang, 15 Vandewater Street, San Francisco, Calif.
Filed July 16, 1971, Ser. No. 163,280
Int. Cl. E04h *1/04, 6/00*
U.S. Cl. 52—236 9 Claims



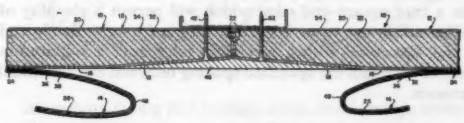
A demountable building usable as a garage with a large number of parking stalls. Precast reinforced concrete vertical frame units each have a width equal to that of a parking stall, and a height equal to the full height of the building at its location. Each frame unit comprises a pair of parallel columns and a series of horizontal beams interconnecting them, and each floor level has a projecting supporting ledge on each column. Each line of frame units has the columns all co-planar, and the frame units are spaced from each other by approximately their own width. Each end of a series of prestressed concrete channels rests side by side on the ledges. The slabs are each the width of a stall and have a pair of depending flanges along each side, these flanges resting on the ledge, and the channel spanning between two series of frame units. The slabs are bolted together and to the frame units to provide the necessary rigidity and to enable demounting.

3,708,934
AIRCRAFT HANGAR STRUCTURE
Jack Jones, Wichita, Kans., assignor to Cessna Aircraft Company, Wichita, Kans.
Filed July 8, 1971, Ser. No. 160,873
Int. Cl. E04h *6/44*
U.S. Cl. 52—237 6 Claims



A six-sided aircraft hangar structure of regular hexagonal cross section having three flat, planar, overhead canopy doors disposed in alternate walls thereof is disclosed herein. The roof of the new structure is centrally supported by a six-sided central module of regular hexagonal cross section, the apices of which module are disposed opposite the midpoints of the hexagonal hangar walls. The roof is laterally supported by six columns and the hangar walls themselves. This unique arrangement provides a large, unobstructed, accessible space for the accommodation of a large number of aircraft, each of which may be independently moved into and out of the hangar through one of the three canopy doors. The central module itself is multi-tiered, providing office and service space for personnel. The design of the structure is such that it may be fabricated efficiently and inexpensively with conventional, simple techniques from readily available flat construction materials.

3,708,935
SIMULATED MONOLITHIC PREDECORATED WALL CONSTRUCTION
Donald A. Kossuth, and John D. Shull, both of Tonawanda, N.Y., assignors to National Gypsum Company, Buffalo, N.Y.
Filed Nov. 7, 1966, Ser. No. 592,358
Int. Cl. E04b *2/10*; B32b *1/02*
U.S. Cl. 52—416 6 Claims



A predecorated wallboard for forming simulated monolithic predecorated wall construction is composed of an elongated rectangular core panel including a set gypsum core enclosed on its two opposite sides and two longitudinal edges with a paper facing layer and having on its front side a flat central surface arranged between recessed marginal surfaces extending from the flat surface to the opposite longitudinal edges of the panel and tapering edgewise toward the rear side of the panel, and a decorative sheet including a cloth backing layer laminated only to the flat surface of the paper facing layer on the front side of the panel throughout the length of such front side and an outer polyvinyl chloride layer forming a decorative front wall surface, such sheet also including a narrower flap extending over one of the marginal surfaces but terminating flush with the adjacent longitudinal edge of the panel and a

wider flap extending over the opposite marginal surface beyond the opposite longitudinal edge of the panel. Each wallboard is adapted to form a joint with an adjacent wallboard, such as a flat joint wherein the adjacent longitudinal edges of the panels are arranged in abutting relationship and the front sides thereof are flush, with the adjacent marginal surfaces thereof forming beneath adjacent narrower and wider flaps a shallow V-shaped recess or space to be filled to the level of the flat surfaces of the panels with a hardened joint cement layer to which the narrower and wider flaps are adhered as well as to each other in overlapping relationship over the marginal surface underlying the narrower flap, the joint being completed by cutting through the overlapping portions of both flaps, by removing the overlapping and overlapped marginal edge portions of the overlying and underlying flaps respectively to cause the narrow flap to terminate short of the adjacent longitudinal edge of the underlying panel, and by readhering the remainder of the overlying flap to cause the wider flap to extend into edge abutting and flush relationship with the narrower flap to form a practically invisible seam.

3,708,936

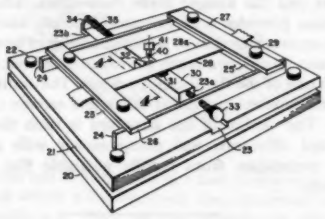
METHOD OF TRIMMING CRYSTALLINE PHOTOSENSOR ARRAYS TO CLOSE TOLERANCES

Cedric G. Rogers, Marlborough, Mass., assignor to Avco Corporation, Cincinnati, Ohio

Filed April 22, 1971, Ser. No. 136,456

Int. Cl. B24c *1/04*

U.S. Cl. 51—310 **3 Claims**



The method of effecting exact trimming of the ends of detector sub-arrays which consist of a base upon which a series of tiny infrared mesa-type photodiode elements are arranged in a longitudinally oriented fashion. The method comprises spraying a tiny jet of abrasive particles in a direction perpendicular to the supporting base of the detector sub-array while masking the sensitive detector elements with a thin elastomer strip in order not only to protect the elements themselves from damage, but to define a precise line of cut in the base and provide a true square end edge which will permit a plurality of similar sub-arrays to be accurately aligned longitudinally end to end. Exactness within very close tolerances is required in order to maintain the specified spacing between the individual elements.

3,708,937

TRAPEZOIDAL TELESCOPING CRANE BOOM

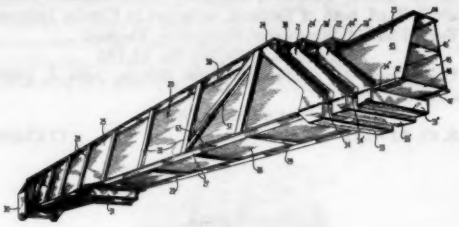
Russell L. Sterner, Greencastle, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Sept. 28, 1970, Ser. No. 75,886

Int. Cl. B66t *11/00*; E04h *12/34*

U.S. Cl. 52—118 **9 Claims**

A crane boom comprises plural extensible and retractable telescoping sections each of which is trapezoidal in cross section. The trapezoidal cross sectional shape imparts to a boom of given weight greater lifting capacity or longitudinal rigidity and greater lateral stability than any other cross sectional shape. The trapezoidal cross section allows for a much more efficient placement of wear pads between boom sections and web stiffeners on the sides and bottoms of the sections.



Adequate internal space is provided for boom extending and retracting means whether hydraulic or mechanical.

3,708,938

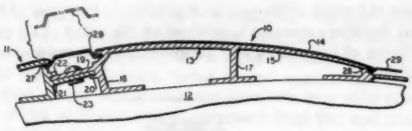
STAINLESS STEEL CLAD ALUMINUM STRAKES AND PANELS

Keith W. Tantlinger, Rancho Santa Fe, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed July 14, 1971, Ser. No. 162,446

Int. Cl. E04c *1/10, 2/08*

U.S. Cl. 52—471 **7 Claims**



Aluminum extrusions for use as strakes and panels in making vehicle bodies and other structures are clad with thin, stainless steel sheet or foil bonded to their exterior surfaces. The edge portions of each stainless steel cladding sheet extend beyond edge portions of its respective extrusion, and are wrapped over such edges and tucked into grooves provided in the sides of the extrusions. The extrusions are mounted with the grooves of adjacent strakes in slightly spaced apart relation, and hat section or other suitable filler strips of stainless steel are mounted to extend across and bridge the gaps between adjacent grooves, the edges of each filler strip being inserted in the grooves along side the edge portions of the cladding material tucked therein.

3,708,939

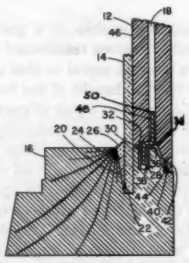
OFFSET DECORATIVE WINDOW GRILL CONNECTION

Robert L. Herr, Manheim, Pa., assignor to Rimar Manufacturing, Inc., Manheim, Pa.

Filed April 7, 1971, Ser. No. 135,506

Int. Cl. E04b *1/48, 1/58*

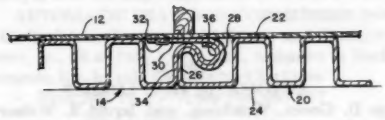
U.S. Cl. 52—456 **8 Claims**



An offset connector for removably affixing decorative window grills over a single light window sash employing a plurality

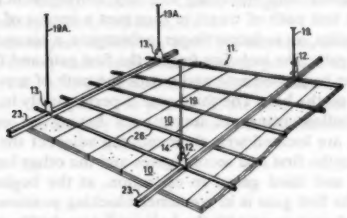
of peripherally spaced sash affixed sockets and a plurality of offset connectors removably affixing within the sockets at one end thereof and connecting at the other end to the ends of decorative window grill bars for positioning and retaining the decorative window grill bars within the sash construction.

3,708,940
CEILING TILE
James D. Harman, R.D. No. 1, Hegins, Pa.
Filed July 6, 1970, Ser. No. 52,411
Int. Cl. E04b 1/54; E04f 13/08
U.S. Cl. 52—588 **1 Claim**



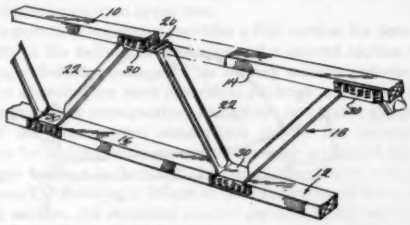
A thin sheet plastic tile for covering ceilings, walls and other structural surfaces is molded with edge portions, at least one of which has an anchoring flap adapted to be stapled to the covered surface underlying the interlocked, abutting edge portion of an adjacent tile. The tile is molded in a vacuum forming device having a loop forming member which is removable with the molded tile from the mold body.

3,708,941
ADJUSTABLE SUSPENSION SYSTEMS IN CEILINGS
Eric Engel Cuckson, Penrith, New South Wales, Australia, assignor to Rondo Building Services Pty. Limited, St. Marys, New South Wales, Australia
Filed Feb. 4, 1971, Ser. No. 112,593
Int. Cl. E04b 5/52
U.S. Cl. 52—484 **6 Claims**



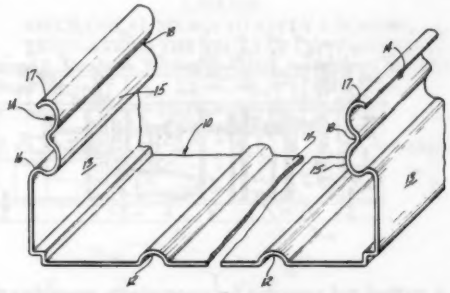
A ceiling suspension system for edge-grooved lining panels or tiles, comprising a plurality of parallel spline assemblies between adjacent pairs of which the panels or tiles are supported by one pair of their opposite sides, means being provided for suspending the spline assemblies at a desired height. Each spline assembly extends substantially the entire length of one dimension of the ceiling and comprises a stationary supporting element of strip material, a ceiling panel-securing spline formed on one longitudinal edge, a longitudinal fold on the opposite edge portion of the element, a plurality of slidable elements, a ceiling panel-securing spline formed on one longitudinal edge portion of each slidable element, and a supporting flange extending along the other longitudinal edge portion of the slidable element slidably engaged within the fold of the stationary element with its spline oppositely directed to the spline of the stationary element.

3,708,942
ROOF TRUSSES
Frank W. Leonard, Route 2, Boise, Idaho
Filed Jan. 12, 1971, Ser. No. 105,957
Int. Cl. E04c 3/12
U.S. Cl. 52—694 **16 Claims**



A truss structure having wooden chord members with a metallic web or strut member therebetween, attachment portions on said web member contacting two facing surfaces on said chord members, a plurality of pointed fastening elements struck and projecting from each of said attachment portions and embedded in said chord members to attach said web member to said chord members, truss connector members for bracing the attachment of said web members to said chord members, said truss connector members fitting over the attachment portions of said web member and around the edges of said chord members so that a plurality of pointed fastening elements struck out of and projecting from each of said truss connectors are embedded in the sides of said chord member.

3,708,943
ALUMINUM FACING AND ROOFING SHEET SYSTEM
George E. Thomas, Hamden, and John J. Krehel, Jr., Stratford, both of Conn., assignors to Olin Corporation
Filed April 22, 1970, Ser. No. 30,815
Int. Cl. E04c 1/10, 1/30
U.S. Cl. 52—588 **30 Claims**



Aluminum facing and roofing sheet, joint configuration or building structures are provided which employ metal panels of channel configuration joined together by means of a separate closure cap. The closure cap is formed around channel-like grooves extending along the free edges of the panel sidewalls. These grooves have S-shaped shoulders and convex free ends which coact with similar shoulders of the closure cap and the anchoring clips to resist heavy loads such as those to be expected from hurricane winds. The panels are normally made of aluminum or aluminum alloys and may be backed by a cellular polymeric material such as polyurethane foam. The anchoring clips are designed to snap into the grooves of adjacent panels so as to hold firm the panels even before the closure cap is formed around the grooves. The anchoring clips may also be designed to include inserts to affect the thermal conductivity or electrical conductivity between the panels and the building frame.

3,708,944

METHOD OF MAKING AN ARCH

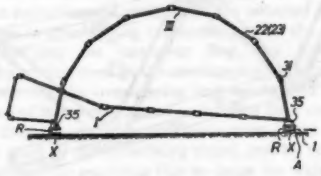
Minobu Miyake, 194 of 1 Shimoshakuji, Tokyo, Japan

Filed Feb. 20, 1970, Ser. No. 13,003

Claims priority, application Japan, Oct. 31, 1969, 44/87390

Int. Cl. E04b *1/32*

U.S. Cl. 52—745 **7 Claims**



A stressed arch fabricated from a plurality of prefabricated structural frame members assembled over a flexible strand which is tensioned for causing the frame members to coact and assume an arch configuration and a method of making same are disclosed. Joint members may be added between each of the frame members. A plurality of connected or intersecting arch configurations may be covered by siding and roofing materials and erected simultaneously to provide a complete building suitable for permanent use or for easily disassembled portable use.

3,708,945

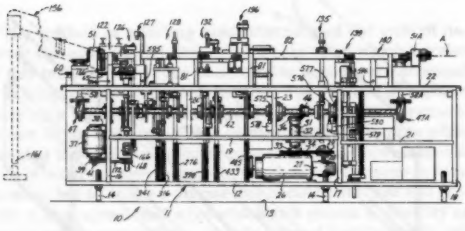
SYRINGE ASSEMBLING METHOD AND MACHINE

Walter G. Klettke, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 6, 1971, Ser. No. 104,257. The portion of the term of this patent subsequent to Feb. 23, 1988, has been disclaimed.

Int. Cl. B65b *3/10, 31/00*

U.S. Cl. 53—22 R **8 Claims**



A method and apparatus for automatically assembling the various components of a syringe having a barrel, a stopper and a hub. Automatic means are provided at various points along the assembly line of the apparatus to effect the assembly of each syringe in a series of steps. The syringe is filled with a liquid during the assembly operation.

3,708,946

PACKAGING FOR CYLINDRICAL AND SIMILAR OBJECTS

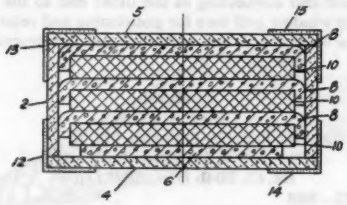
Robert Francis Cahill, Westport, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 1, 1970, Ser. No. 94,117

Int. Cl. B65b *1/04;* **B65d** *71/00*

U.S. Cl. 53—37 **4 Claims**

Packaging is provided using an outer tube selected to be one size larger than the objects to be packaged. Individual objects are held in position within the tube by foam discs. The ends of



the tube are closed by fiber discs which are held in position by adhesive coated tape.

3,708,947

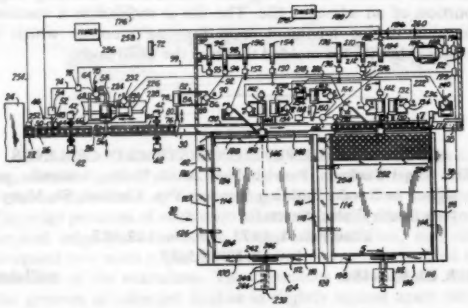
AUTOMATIC TRAY LOADER

George D. Green, Watchung, and Jerold S. Weiner, Spotswood, both of N.J., assignors to Cozzoli Machine Company, Plainfield, N.J.

Filed April 9, 1971, Ser. No. 132,677

Int. Cl. B65b *57/08*

U.S. Cl. 53—55 **19 Claims**



A tray loader for containers in which containers are moved by a continually travelling flat top conveyor belt along a straight line path of travel in turn past a sensor of stationary receptacles, an isolation finger, a first gate, a second gate and a third gate. The isolation finger, the first gate and the second gate can be moved into and out of the path of travel of containers on the belt. The third gate is permanently in said path. Two shallow transport trays, each having an open front mouth, are located with their mouths adjacent the belt, one between the first and second gates and the other between the second and third gates. In operation, at the beginning of a cycle the first gate is in container-blocking position to detain travel of containers with the belt until a single file of abutting stationary containers backs up to the sensor which, upon actuation, moves the isolation finger across the conveyor so as to define a single file string of contacting containers, the length of which is equal to the width of the trays. Thereafter the first gate retracts from container-blocking position permitting the string of grouped containers to move along with the belt, either to the second gate if it happens to be in container blocking position, or to the third gate if the second gate is out of container-blocking position. After the string reaches either the second or third gate a pusher transfers the string of containers transversely off the belt and into the open mouth of the associated tray. After the last container in the string passes the first gate, the first gate moves back to blocking position and the isolation finger moves out of blocking position permitting fresh containers to move with the conveyor to the first gate. This cycle of operations is repeated until one of the trays is filled. Thereupon the same cycle of operations is performed with respect to the other tray by moving the second gate either

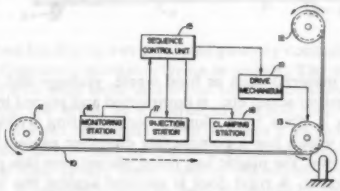
to blocking or unblocking position, as the case may be. While the string of containers is being blocked by the second or third gate as the conveyor moves beneath them the linear integrity of the string is maintained by parallel members on opposite sides of the string, one of these members being the pusher. The other member moves with the pusher as the string of containers is transferred from the conveyor belt to a tray but is lifted after the containers clear the conveyor belt so as to densely mass the containers on the tray. Optionally, alternate rows of containers transferred into a tray fluctuate in length by one container so as to mass the containers in the tray in a hexagonal, rather than an orthogonal, pattern.

3,708,948

AUTOMATIC FRACTION COLLECTOR

Joseph G. Carleton; Cassius R. McEwen, and Frederick G. Williams, Jr., all of Palo Alto, Calif., assignors to Beckman Instruments, Inc. by said Carleton and McEwen

Filed Jan. 11, 1971, Ser. No. 105,417
Int. Cl. B65b *5/10, 57/12*
U.S. Cl. 53—74 **6 Claims**



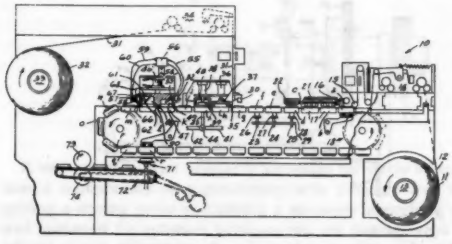
An apparatus and method for collecting fractions from a gas-segmented fluid stream including introducing a series of fluid segments into a tubular conduit and sealing the tubular conduit at either end of each injected fluid segment to form a series of individual tubular compartments with each compartment containing a single fluid segment.

3,708,949

METHOD AND APPARATUS FOR DETECTION OF LEAKS IN SEALS OF PACKAGES

Burdsal G. Wilcox, Oakland, Calif., assignor to Safeway Stores, Incorporated, Oakland, Calif.

Continuation-in-part of Ser. No. 803,798, March 3, 1969, Pat. No. 3,591,944, which is a continuation-in-part of Ser. No. 796,460, Feb. 4, 1969, abandoned. This application Oct. 9, 1970, Ser. No. 79,552. The portion of the term of this patent subsequent to July 13, 1988, has been disclaimed.
Int. Cl. B65b *57/00, 31/02*
U.S. Cl. 53—53 **10 Claims**



A machine for forming and testing sealed packages from heat-sealable packaging materials employs an apparatus for forming individual packaging trays for receiving the product to be packaged from a first continuously fed web of heat-sealable flexible packaging material. A second continuously fed web of heat-sealable packaging material is directed along a path parallel to the path of the first web and is partially heat-sealable thereto to package the product. After partial sealing, each of the serially connected train of packages is connected in fluid communication with means for evacuating the ambient atmosphere therefrom and replacing the ambient atmosphere with a preservative atmosphere. The package is then sealed to prevent escape of the preservative atmosphere and transported along the machine, still in the package train, to automatic inspection apparatus.

The inspection apparatus provides a first section for detecting leaks in the individual packages and a second section for marking defective packages. The sensing section includes a pressure chamber for each individual package and means for sensing gas of the preservative atmosphere or a tracer gas portion of the preservative atmosphere should the inspected package be leaking such gas and to develop a control signal when gas leakage is detected. The marking section includes apparatus for marking a defective package received from the sensing section. An electrical control circuit extends between the sensing and the marking section to provide operative control of the marking apparatus at a delayed time which permits the travel of a package from the sensing section of the packaging machine to the marking section of the machine.

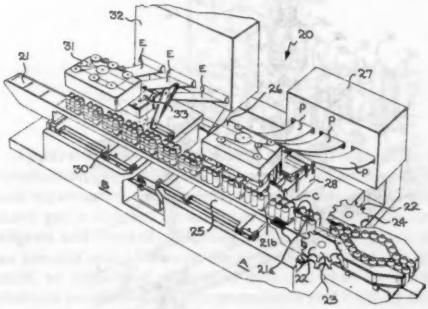
After inspection, the packages are separated and the unmarked packages are then prepared for shipment while the marked packages are diverted so that their products may be repackaged. Inasmuch as the packages may be scuffed or in other ways have the integrity of their seals weakened or broken, for example the package material may be burned by labelling techniques, the packages are placed in an overwrap carton and the carton is subjected to another pressure test prior to sealing whereupon detection of the preservative atmosphere will signal that the carton contains a leaky package or packages. Cartons containing only sealed packages may then be further packaged for shipment and cartons containing leaky packages may be diverted for testing of the individual packages.

3,708,950

MECHANICAL MEANS TO APPLY A PLASTIC TEMPLATE TO THE NECKS OF CONTAINERS

Eugene F. Doucette, Burlington, Mass., assignor to Owens-Illinois Inc.

Filed Feb. 19, 1971, Ser. No. 116,803
Int. Cl. B65b *27/04*
U.S. Cl. 53—48 **9 Claims**



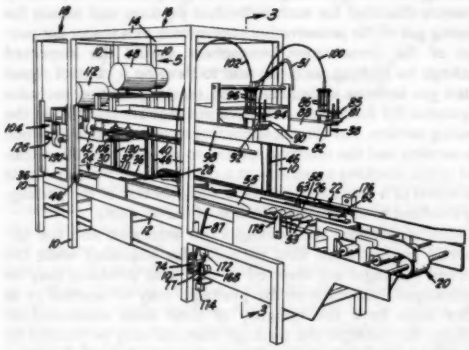
Containers having a body portion and a relatively smaller neck portion are segregated into groups or clusters and a carrier having openings therein is telescoped over the neck portion to complete the package.

3,708,951

SEALER FOR RANDOM SIZE SHIPPING CASES

Dennis L. Folk, Lincoln Park, and Cyril A. Pavnica, West Reading, both of Pa., assignors to Bemis Company, Inc., Minneapolis, Minn.

Filed July 27, 1970, Ser. No. 58,536
Int. Cl. B65b 57/02, 7/20
U.S. Cl. 53—75 4 Claims



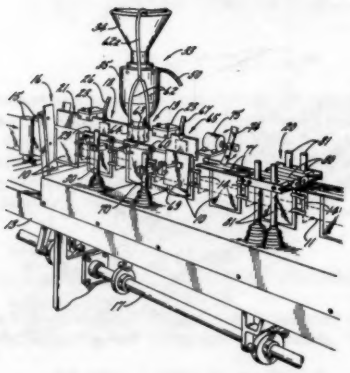
Apparatus for sealing shipping cases including a sealing section adjustable upon the receipt of a signal from a case sensing means to accommodate successive cases of different dimensions and a compression section also adjustable to accommodate such cases, the adjustment of the compression section being controlled by the adjustment of the sealing section and being timed to occur following the entry of a case into the sealing section and the discharge of the previously sealed case from the compression section.

3,708,952

PACKAGING MACHINE WITH SPLITTER BAR FILL

James R. Schulze, and Joe F. Soroka, both of Rockford, Ill., assignors to Rexham Corporation, New York, N.Y.

Filed Aug. 16, 1971, Ser. No. 172,034
Int. Cl. B65b 31/04
U.S. Cl. 53—112 B 11 Claims



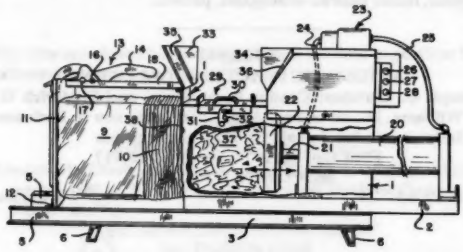
Pouches are filled with a particulate product through a nozzle in a splitter bar. A non-oxidizing gas propels the product through the nozzle while also serving to purge the product and the pouches of oxygen.

3,708,953

WASTE COMPACTOR AND BAGGER

Dominick M. Aluotto, Brooklyn, N.Y., assignor to Antonio Aluotto d.b.a. National Baling Press and Equipment Co., Brooklyn, N.Y.

Filed Dec. 29, 1970, Ser. No. 102,329
Int. Cl. B65b 1/24
U.S. Cl. 53—124 B 4 Claims



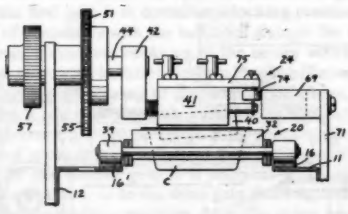
Waste material such as food waste, garbage and refuse or rubbish, paper scrap etc., is compacted and placed in a plastic bag. This is done by a plunger reciprocating within a body structure which has a compacting chamber projecting freely from one end, the plastic bag being placed over this portion of the apparatus. A rigid door is secured against the bottom of the bat and over the otherwise open end of the compacting chamber. The waste material is fed into a lateral opening and after repeated insertions and repeated operations of the plunger the compacting chamber is filled and then the bag is pushed off from the chamber in filled condition and tied.

3,708,954

PACKAGING MACHINE WITH CUTTING MECHANISM

Howard C. Wilke, Belvidere, and Romaine A. Williams, Rockford, both of Ill., assignors to Anderson Bros. Mfg. Co., Rockford, Ill.

Filed March 15, 1971, Ser. No. 124,206
Int. Cl. B65b 7/28; B23d 25/04, 25/06
U.S. Cl. 53—329 10 Claims

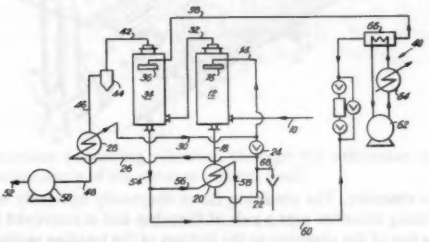


The machine has a conveyor which continuously advances containers past a sealing head and a cutting station. The sealing head seals a continuous strip of cover material to the containers. A pair of cutters are mounted for orbital movement at the cutting station. A cam is mounted on the machine to be engaged by a cam follower which is carried with the cutters to move the cutters crosswise of the conveyor and sever the cover material between adjacent containers.

3,708,955
METHOD FOR DRYING GASES

Rafael Foguet Ambros, Flix, Spain; Alexander Beerwald, Frankfurt/Main, and Arnold Lang, Marburg/Lahn, both of Germany, assignors to Electro-Quimica de Flix S.A., Barcelona, Spain

Filed Sept. 9, 1968, Ser. No. 758,520
Claims priority, application Spain, Sept. 9, 1967, 344914
Int. Cl. B01d *47/06*
U.S. Cl. 55—31 **6 Claims**

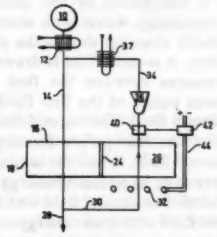


A method for drying wet industrial gases by contacting them with a refrigerated inorganic brine is shown. The wet gas is contacted with cold brine and water vapor is condensed from the gas into the brine. In a preferred method, two stages of gas-liquid contact are employed to produce a particularly dry gas product. Brine used in the first contacting zone is heat exchanged with colder brine used in the second contacting zone; and, if desired, it may be heat exchanged with dry cold gas product from the second zone before recycle to the first zone. Brine from the second zone is subjected to refrigeration before recycle to the second zone. Drying is carried out in conventional packed towers, at low pressure, and does not require system regeneration or replacement of expensive adsorbents.

3,708,956
REGENERATIVE DRIER FOR AIR TO BE CONDITIONED

Per Gunnar Norback, Lidingo, Sweden, assignor to Carl Georg Munters, Stocksund, Sweden

Filed Nov. 27, 1970, Ser. No. 92,991
Claims priority, application Sweden, Dec. 1, 1969, 16493/69
Int. Cl. B01d *53/06*
U.S. Cl. 55—20 **8 Claims**

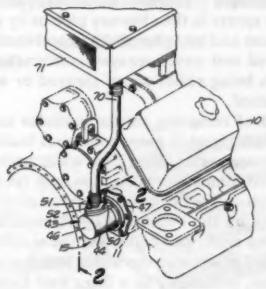


A regenerative drier primarily intended for air to be conditioned compressed to superatmospheric pressure and comprising a drying rotor containing a moisture absorbing mass and mounted for rotation between two air passageways thru which one is passed by the air to be conditioned and the second by regenerating air for the moisture absorbing mass, said second air housing a heater the supply of heat to which is controlled by a hygrostat disposed in said second passage at the outlet side as it passes from the rotor. When the regenerating air is circulated in a closed circuit, a portion of said circuit is constituted by said first passage so that the dehumidification of the regenerating air is partially effected within said rotor.

3,708,957
EXHAUST FILTER UNIT AND METHOD OF FILTERING EXHAUST

Paul A. Labadie, Redondo Beach, Calif., assignor to Farr Company, El Segundo, Calif.

Filed Feb. 19, 1971, Ser. No. 116,913
Int. Cl. B01d *19/00*
U.S. Cl. 55—36 **31 Claims**

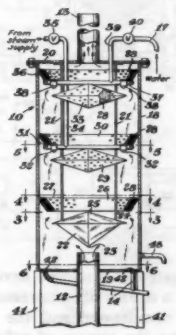


Exhaust from the crankcase of a combustion engine is communicated to a filter to separate undesireable particulate matter, including oil droplets, from the exhaust. During the filtering of the exhaust the filter is adapted to remove the separated matter from the filter media to avoid clogging. The separated oil is returned to the crankcase and the filtered exhaust is re-cycled back into the engine.

3,708,958
DEVICE AND METHOD FOR REMOVING POLLUTANTS FROM STACK GASES

Cermillus H. Duty, 3233 Lexington Drive, Saginaw, Mich.; Steven J. Stuit, and Jack B. Stuit, both of 5558 Michael Drive, Bay City, Mich.

Filed July 19, 1971, Ser. No. 163,932
Int. Cl. B01d *53/14*
U.S. Cl. 55—89 **15 Claims**



Apparatus for removing smoke particles and water soluble combustion gases from stack gases, e.g., of roofing tar heaters and supermarket incinerators, having a body shell in which the stack gas is directed upwardly around at least three vertically aligned and centrally disposed baffle elements, each defining an annular space between the periphery thereof and the body shell, an associated peripheral deflector skirt for each baffle element positioned slightly thereabove and baffling the annular space thereabout and being contiguous to the body shell, a horizontally disposed array of downwardly directed steam nozzles positioned between the associated baffle element and deflector skirt combination above the lowest most baffle element and deflector skirt, and a similar array of water nozzles between the uppermost baffle element and deflector skirt

combination, the stack gas exiting from the body shell to a chimney pipe. Each of the peripheral deflector skirts, and each of the baffle elements except the lowest one, are formed of foraminous metal shells such as perforated metal and filled with an activated adsorbent material such as activated anthracite, the lowest most baffle being imperforate. Drains are provided in the floor of the body shell and preferably lead the steam condensate and collected water spray to a filter unit from which water is recycled to the water nozzles. Additional scrubbing capacity is provided by either or both of placing opposed water sprays in the chimney pipe or by utilizing a fourth baffle element and peripheral skirt combination between the water sprayed and steam sprayed combinations, such fourth combination being either steam sprayed or water sprayed as may be required.

The method of removing smoke particles and soluble combustion gases from stack gases comprises leading the stack gas through the apparatus described while utilizing little more than sufficient steam in combination with the activated adsorbent to absorb and remove visible smoke particles and enough water to take up the steam but insufficient to interfere seriously with the draft, and collecting the scrubbed materials in the condensed steam and the water and draining them out of the apparatus, preferably to a filter unit from which recycle water is obtained.

3,708,959

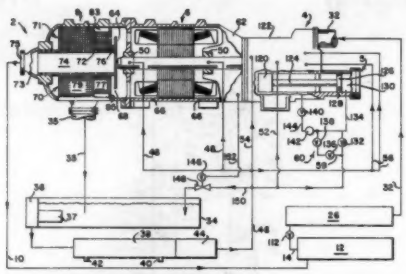
METHOD FOR SEPARATING OIL FROM COMPRESSED GAS

Henri Soumerai, West Hartford; Harold W. Moody, Jr., Farmington; Clark B. Hamilton, Wethersfield, and James R. Blatt, Coventry, all of Conn., assignors to Dunham-Bush, Inc., West Hartford, Conn.

No Drawing. Continuation-in-part of Ser. No. 612,222, Jan. 27, 1967, Pat. No. 3,408,826, which is a division of Ser. No. 666,372, Sept. 8, 1967, Pat. No. 3,408,828, and a continuation of Ser. No. 810,410, Oct. 25, 1968, abandoned. This application July 9, 1971, Ser. No. 161,275

Int. Cl. B01d *50/00*

U.S. Cl. 55—97 **10 Claims**



A refrigeration system is disclosed having a compressor of the screw type, and a stream of compressed gas and oil mist is used to cool the compressor and the motor. The oil is separated by passing the stream of refrigerant gas and oil through a unit which subjects the oil-laden gas to a thorough oil-separating treatment without restricting the flow of the oil-free gas.

3,708,960

HEATER-TREATER

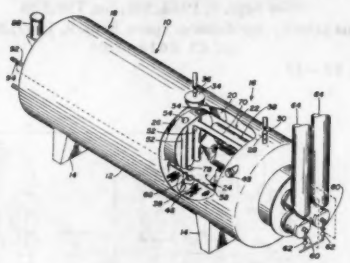
William H. Christopher, Jr.; Charles O. Meyers, both of Tulsa, and Jack C. Whipple, Jr., Sapulpa, all of Okla., assignors to Process Technologists Internation Division of Trinity, Inc., Dallas, Tex.

Filed Feb. 10, 1971, Ser. No. 114,244

Int. Cl. B01d *19/00*

U.S. Cl. 55—169 **15 Claims**

In a heater-treater, a tank is divided into separate heating and treating sections, and the heating section is in turn divided into a receiving zone and an enclosed heating chamber. A pair of downcomers convey emulsion from the top of the receiving zone to the bottom of the heating chamber, and a portion of the emulsion flowing from the downcomers is directed across a discharge passageway to flush sediment and free water from



the chamber. The emulsion flows diagonally upwardly in the heating chamber past a pair of firetubes and is conveyed from the top of the chamber to the bottom of the treating section by a conduit. The operation of the firetubes is controlled by thermostats located in the upper portion of the heating chamber adjacent the inlet of the conduit.

3,708,961

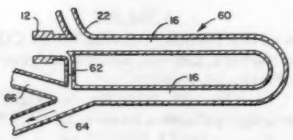
DIRECT FLUID ENERGY TRANSFER

George T. Kimmel, III, 142 Hillcrest Drive, Berrien Springs, Mich.

Filed Oct. 5, 1970, Ser. No. 78,134

Int. Cl. B01d *50/00*

U.S. Cl. 55—261 **5 Claims**



Fluid energy is transferred by first generating pulses of a first fluid in compression waves with alternate high and low pressures. A tubular chamber directs the path of propagation of first fluid pulses. A second fluid is drawn into the chamber by the low pressures between the first fluid compression waves. Subsequent pulses of the first fluid entrap, drive and compress the second fluid. The second fluid is accelerated to the velocity of the first fluid pulses, thereby increasing kinetic energy of the second fluid. When the second fluid is a gas, it is compressed, increasing its potential energy. Subsequently, the fluids are separated. The second fluid with increased energy is used, and the first fluid with spent energy is discarded.

3,708,962

VACUUM CLEANER

Yutaka Deguchi; Hideo Kashihara; Rikuzo Koozuki; Kazuyoshi Takahashi, and Mitsuyuki Ikeda, all of Hyogo, Japan, assignors to Sanyo Electric Co. Ltd., Osaka, Japan

Filed March 18, 1971, Ser. No. 125,696

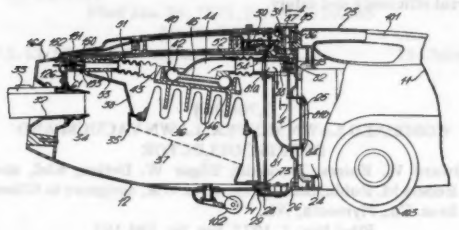
Claims priority, application Japan, March 20, 1970, 45/23781; March 20, 1970, 45/44642; March 20, 1970, 45/44643

Int. Cl. B01d *46/04*

U.S. Cl. 55—300 **6 Claims**

The vacuum cleaner includes a vibration generator for

removing the dust attached to the filter cloth, said vibration



generator producing vibration through the utilization of the suction force of the vacuum cleaner itself.

3,708,963

ASSEMBLY FOR SEPARATING A SUBSTANTIALLY DUST-FREE PART FROM A SPACE

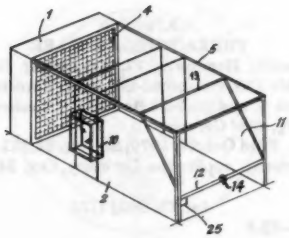
Willem Frederik Boonstra, Mozartlaan 6, Castricum; Tabe Ernst Meindersma, Merelhoven 110, Capelle aan de Yssel, and Piet Van Galen, Vlietlaan 81, Assendelft, all of Netherlands

Filed Sept. 8, 1970, Ser. No. 70,454

Claims priority, application Netherlands, Sept. 10, 1969, 6913810

Int. Cl. B01d *50/00*

U.S. Cl. 55—373 **11 Claims**



A tent like assembly, preferably in the form of a tubular duct of transparent, flexible plastic material, is suspended from a framework to define a dust-free patient isolation chamber which is large enough to accommodate attending personnel. Air, introduced into one end of the chamber via a dust filtering means, flows horizontally through the chamber and exits therefrom through the discharge opening in the other end of the chamber. This air flow, which is substantially non-turbulent and is directed generally throughout the entire height and width of the chamber, maintains the chamber substantially dust free. Attending personnel enter the chambers through a door, which normally closes a major portion of the discharge chamber and defines the discharge opening. The air flow is controlled to prevent dust in the surrounding atmosphere from entering the chamber while the door is open and tends to purge away any dust which might otherwise be introduced by entering personnel. Treatment apparatus and the like can be introduced into the chamber through closeable transfer openings in the side of the tent.

3,708,964

DEVICE FOR THE SEPARATION OF GASEOUS OR VAPOROUS SUBSTANCES, ESPECIALLY ISOTOPES, WITH DIFFERENT MOLECULAR WEIGHTS AND/OR DIFFERENT GAS KINETIC CROSS SECTIONS

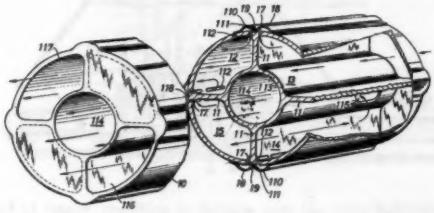
Erwin Becker, Karlsruhe-Durlach, and Rolf Schutte, Karlsruhe-Waldstadt, both of Germany, assignors to Gesellschaft Fur Kernforschung m.b.H, Karlsruhe, Germany

Filed Sept. 30, 1969, Ser. No. 862,406

Claims priority, application Germany, Sept. 30, 1968, P 17 94 274.4

Int. Cl. B01d *59/00*

U.S. Cl. 55—392 **9 Claims**



A device for the separation of gaseous isotopes includes a tube divided by partition walls into feed lines and discharge lines, the partition walls extending radially outwards into the wall of the tube substantially to the outer surface of the wall. Gas conducting elements conduct a mixture of isotopes around the ends of the partition walls where the mixture is separated into a light fraction and a heavy fraction.

3,708,965

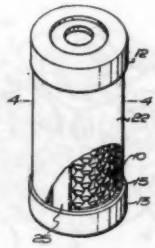
GAS FILTERS

Keith Raphael Domnick, East Boldon, County Durham, England

Filed Sept. 8, 1970, Ser. No. 70,246

Int. Cl. B01d *27/00*

U.S. Cl. 55—488 **2 Claims**



A gas filter is provided for the removal of extremely finely divided aerosols and water including particles in the range of 0.01 to 0.8 microns in size and especially oil in compressed air; the liquid is coalesced in a filter medium of non-absorbent fiber and collected from a sleeve carried downstream of the filter medium which is held compressed between inner and outer fluid permeable support members the ends of which are sealed to the juxtaposed edge regions of the filter medium.

ERRATUM

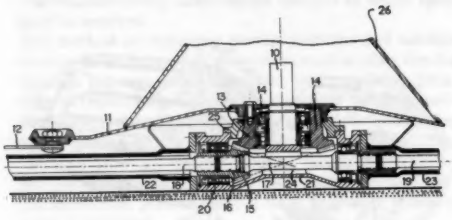
For Class 55—73 see:
Patent No. 3,708,981

3,708,966

AGRICULTURAL MACHINE ROTOR-TYPE CUTTING MECHANISM

Walter Reber, Saverne, France, assignor to Societe Kuhn Freres & Cie, Societe En Commandite Simple, Saverne, Bas-Rhin, France

Filed Feb. 10, 1970, Ser. No. 10,140
Claims priority, application France, Feb. 25, 1969, 6905002
Int. Cl. A01d *75/30*
U.S. Cl. 56—6 13 Claims



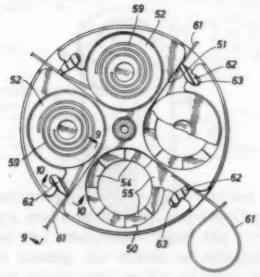
A rotary-scythe mower or other agricultural machine rotor-type cutting mechanism having a drive below the rotors, including one or more non-rotating spindles at least substantially concentric with one or more of the rotors.

3,708,967

ROTARY CUTTING ASSEMBLY

Thomas N. Geist, and George C. Ballas, both of Houston, Tex., assignors to said Ballas, by said Geist

Filed Dec. 31, 1971, Ser. No. 207,198
Int. Cl. A01d *55/18*
U.S. Cl. 56—12.7 10 Claims



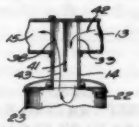
An improved cutting assembly for rotary lawn mowers, edgers, or the like, including a body member arranged for rotating about an axis normal with the cutting plane. At least one cutting line is attached to the body member for rotation therewith in the cutting plane. The line is characterized by having a working length to diameter ratio and a material composition to render the line substantially limp and nonself-supporting in the static condition. Certain embodiments of the invention may include means for detachably securing the lines to the body member and for storing a supply of the line on the body member so that the line may be paid out as the working portions of the line become shortened through wear. The cutting lines are preferably nonmetallic so as to reduce the hazardous condition which would otherwise be present for the operator and still provide an apparatus which will cut with great efficiency and safety.

3,708,968

COMBINED LAWN MOWER, LAWN VACUUM AND DEBRIS COLLECTOR

Edward W. Enters, Fredonia; Edgar W. Detjen, Kiel, and Robert M. Rubin, Sheboygan, all of Wis., assignors to Gilson Bros. Co., Plymouth, Wis.

Filed Nov. 1, 1971, Ser. No. 194,197
Int. Cl. A01d *35/22*
U.S. Cl. 56—16.5 6 Claims



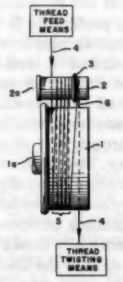
A combined lawn mower, lawn vacuum and debris collector includes a housing for a rotary lawn mower blade, a discharge chute for air entrained debris leading from the lower housing to a separator which separates debris from the air, a collector for receipt of separated debris and a return chute for separated air, said return chute having an outlet in said housing for recirculating said separated air back to the mower housing.

3,708,969

THREAD GUIDE ROLLER

Peter Klementz, Hertenweg 77, Erlenback; Heinz Massat, Bergerheide 125, Wuppertal-Elberfeld; Chrostoph Nitschke, Schlesierstr 9, and Herbert Haubold, Schlesierstr 5, both of Obernburg, all of Germany

Filed Oct. 20, 1970, Ser. No. 82,312
Claims priority, application Germany, Oct. 24, 1969, P 19 53 527.4
Int. Cl. D02j *1/22*
U.S. Cl. 57—55.5 10 Claims

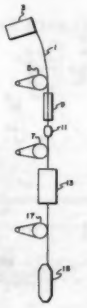


A thread guide roller provided with a radially projecting circumferential bead intermediate the ends of its cylindrical thread contacting surface, particularly in combination with a godet in draw-twist apparatus.

3,708,970
YARN PROCESS

Iain Mackay MacFarlane, Shelby, N.C., assignor to Fiber Industries, Inc.

Filed Jan. 29, 1971, Ser. No. 110,985
Int. Cl. D02g *1/02*
U.S. Cl. 57—140 R **15 Claims**

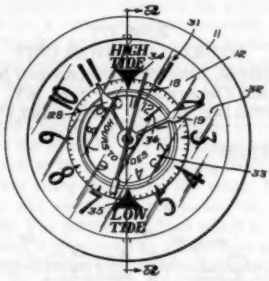


Textile denier, multifilament, false twist crimped, heat set stabilized polyester yarn characterized by liveliness and filamentation values and a simultaneous draw-texturing process for the production thereof.

3,708,971
TIDE INDICATING TIMEPIECE

Edwin W. Wlodyka, Ashland, Mass., assignor to Highland Laboratories, Ashland, Mass.

Filed July 20, 1970, Ser. No. 56,460
Int. Cl. G04b *45/00*; G07c *1/00*
U.S. Cl. 58—3 **19 Claims**



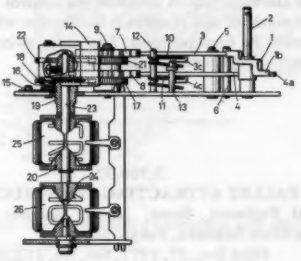
Disclosed is a timepiece that indicates both current solar time and the periods of time that will elapse before the next high and low tides. Relative rotational movement between tide indicators and a tide scale is produced by a coupling assembly driven by the hour shaft of a conventional clockworks. The coupling assembly converts the hour shaft's velocity into a 0.0805 revolutions per hour velocity that corresponds to the average time cycle between high and low tides.

3,708,972
CORRECTING MECHANISM OF DATE- AND DAY-INDICATIONS IN LEAF-TYPE CLOCK

Hideo Koide, Urawa, Japan, assignor to Rhythm Watch Company, Limited, Tokyo, Japan

Filed Feb. 16, 1972, Ser. No. 226,876
Claims priority, application Japan, Feb. 23, 1971, 46/9688
Int. Cl. G04b *19/02*, *19/00*
U.S. Cl. 58—6 R **9 Claims**

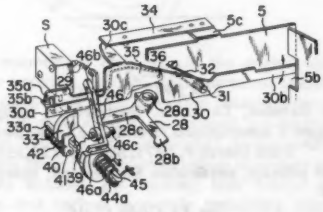
The correcting mechanism of date- and day-indications in a leaf-type clock includes an operating lever, an operating shaft, a date corrector and a day corrector, both of which are pivoted on a common shaft, and a date star wheel and a day star wheel, both of which are pivoted on another common shaft. When the operating lever is manually rotated clockwise by the operating shaft, its left end engages the right end of the date corrector and compresses the latter against the date corrector spring which has imparted a clockwise bias to the date corrector. Thereby a left end pawl of the date corrector engages with the teeth of the date star wheel and causes this star wheel to rotate, resulting in turning over the date indicating leaf-plate, that is, correcting of the date-indication. Similarly, when the operating lever is manually rotated counterclockwise, its right end engages the right end of the day corrector and compresses the latter against the day corrector spring which has imparted a clockwise bias to the day corrector. Thereby a left end pawl of the day corrector engages with the teeth of the day star wheel and causes this star wheel to rotate, resulting in turning over the day indicating leaf-plate, that is, correcting the day-indication.



3,708,973
DIRECTLY READABLE DIGITAL CLOCK

Takashi Funaki, Shimosuwa-machi, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano-ken, Japan

Filed July 7, 1970, Ser. No. 52,797
Claims priority, application Japan, July 11, 1969, 44/65206; July 17, 1969, 44/56049; July 19, 1969, 44/68942; July 19, 1969, 44/57141
Int. Cl. G04c *21/16*
U.S. Cl. 58—19 **8 Claims**



In the directly readable digital clock disclosed a sector-shaped cam is keyed to an operating shaft. The operating shaft can be turned to one of four discreet positions. In each of the positions, a lever arm rests on the peripheral surface of the cam. At the end of a time period set into the clock, a timer knocks the lever off the cam periphery and onto a pin extending eccentrically from the cam. In the first cam position, the cam surface initially pushes the lever on to a position that closes a radio switch and opens an alarm switch. In the other three shaft positions the cam causes the lever arm initially to open both the radio switch and the alarm switch. In the first position, at the end of the timing cycle, the pin catches the lever arm in virtually its original position so that the radio switch remains on and the alarm switch off. In the second posi-

tion, the pin also catches the lever in the original position so that both switches remain off. In the third position, the pin catches the lever so as to allow closing of the radio switch only. In the fourth position, the pin catches the lever so as to allow closing of both positions. A settable crown gear is engageable with a shaft-driven spur gear so that the crown gear can be turned from its set position to a final position by the clock. In its set position, a control cam, keyed to the crown gear causes a lever member to prevent movement of the lever arm in a direction in which it would open the radio switch or close the alarm switch. A notch in the control cam withdraws the lever member and renders it ineffective when the control cam reaches its final position. The radio switch may also be used to turn on other electrical appliances.

3,708,974

PALLET ATTRACTING CONSTRUCTION

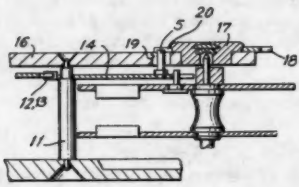
Motoyuki Fujimori, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 27, 1971, Ser. No. 212,360

Claims priority, application Japan, Dec. 28, 1970, 45/132716

Int. Cl. G04c *3/04*

U.S. Cl. 58—28 R **4 Claims**



A pallet attracting construction wherein a C-shaped recess is rotatably mounted in the region of a balance bearing. A pallet having a member formed of a magnetic material secured thereto is positioned so that said member oscillates between the facing ends of said permanent magnet in an elongated hole in a support plate, the ends of said hole limiting the displacement of said pallet.

3,708,975

FLAT PIN PALLET

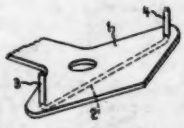
Georges Davoine, Le Locle, Switzerland, assignor to Les Fabriques d'Assortiments Reunies, Le Locle, Switzerland

Filed March 9, 1971, Ser. No. 122,354

Claims priority, application Switzerland, March 12, 1970, 3670/70

Int. Cl. G04b *15/08*

U.S. Cl. 58—121 R **7 Claims**



A pin pallet for a timepiece escapement comprises a pallet plate stamped from thin sheet material and having a pair of laterally spaced openings, a pin member comprising a U-shaped wire being bonded to said plate with its arms extending through said openings to constitute the pins.

3,708,976

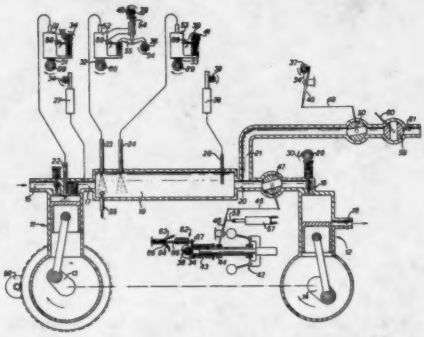
GENERATION OF HOT VAPOR

Martin John Berlyn, Beacon Lodge, Texas Street, Leeds, England

Filed May 25, 1970, Ser. No. 40,056

Int. Cl. F02g *1/02*

U.S. Cl. 60—39.25 **19 Claims**



A method of and apparatus for generating a hot vapor at high pressure, wherein primary water is sprayed into air during compression thereof and the compressed air with the entrained water as superheated steam is delivered into a combustion chamber where fuel is injected and burned continuously, a secondary water supply being sprayed simultaneously into the combustion chamber and at a rate which determines the temperature of the efflux from said chamber.

3,708,977

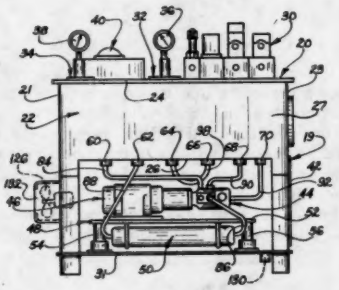
HYDRAULIC POWER UNIT

Robert E. Raymond, Zanesville, Ohio, assignor to International Basic Economy Corporation, New York, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,174

Int. Cl. F15b *15/18*

U.S. Cl. 60—52 US **9 Claims**



A hydraulic power system for supplying fluid power to hydraulically operated machines such as machine tools or the like which comprises a frame means, the upper portion of which includes a reservoir that serves the multiple function of enclosing certain components of the system, an upper panel that forms a mounting means for modulized system valving and read-out devices, and a lower reservoir wall that includes couplings between said certain components enclosed by said reservoir and external components of the system.

3,708,978

REGULATING APPARATUS FOR AXIAL PISTON MACHINES OR THE LIKE

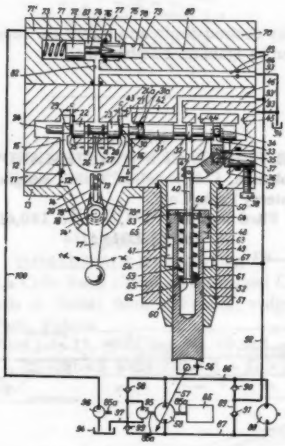
Karl Reiff, Sersheim, and Peter Muhlich, Esslinger-Sulzgries, both of Germany, assignors to Robert Bosch, GmbH, Stuttgart, Germany

Filed Aug. 12, 1971, Ser. No. 171,289

Claims priority, application Germany, Aug. 13, 1970, P 20 40 205.5

Int. Cl. F16h *39/46*

U.S. Cl. 60—53 R 16 Claims



A regulating apparatus for changing the position of an adjusting member for a variable-output reversible axial piston machine has a housing wherein a plenum chamber is flanked by two coaxial plungers which are movable axially to thereby move the adjusting member by way of a hydraulic power amplifier and a valve member which regulates the flow of fluid into and from the cylinder chambers of the power amplifier. The positions of the plungers can be changed by a pivotable input lever as well as by a torque limiting device which employs an auxiliary pump driven by the motor for the axial piston machine and serving to pressurize the fluid in the plenum chamber. The pressure of fluid which is delivered by the auxiliary pump is influenced by a fixed flow restrictor and by a second flow restrictor which is adjustable as a function of system pressure.

3,708,979

CIRCUITAL FLOW HOT GAS ENGINES

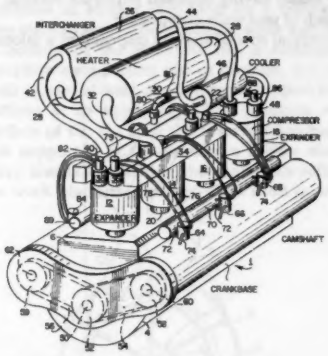
Vannevar Bush, Belmont, and Joseph L. Smith, Jr., Concord, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed April 12, 1971, Ser. No. 133,105

Int. Cl. F01b *1/00*

U.S. Cl. 60—59 R 34 Claims

A compressor, heater, expander and cooler are connected to form a closed circuit. Valves control the pulsating flow of a working gas about this circuit. An interchanger may be included in the circuit to allow use of a low expansion ratio with a high ratio of extreme temperatures. Relatively large volumes of heater and cooler may be used. Power output is controlled by altering valve timing. Alternately, power output may be



controlled by the use of auxiliary chambers and altering the mass of working gas in the circuit.

3,708,980

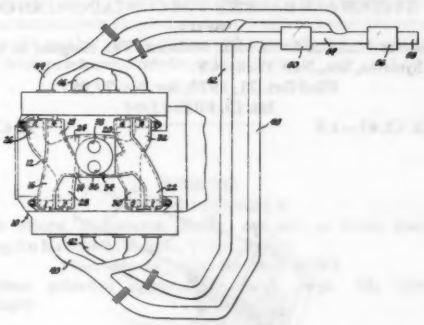
INTERNAL COMBUSTION ENGINE AND METHOD OF OPERATION

Robert W. Truxell, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 26, 1971, Ser. No. 166,035

Int. Cl. F02b *75/10, 15/00*

U.S. Cl. 60—274 6 Claims



Alternate combustion chambers in the engine operating sequence are supplied rich and lean mixtures, respectively. The exhaust gases from the combustion chambers receiving a rich mixture are conducted to an exhaust gas treating unit which reduces oxides of nitrogen formed during combustion, and the exhaust gases from all combustion chambers are conducted to an exhaust gas treating unit which oxidizes hydrocarbons and carbon monoxide remaining after combustion.

3,708,981

ADSORPTION METHOD AND APPARATUS FOR TREATING POLLUTED GAS STREAMS

Friedrich Johswich, Essen-Sud, and Werner Schindelbeck, Lovenich, both of Germany, assignors to Chemiebau Dr. A. Zieren GmbH & Co. KG, Koln-Braunsfeld, Germany

Filed Sept. 11, 1970, Ser. No. 71,511

Claims priority, application Germany, Sept. 13, 1969, P 19 46 457.4

Int. Cl. B01d *53/06*

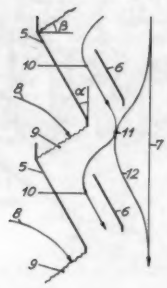
U.S. Cl. 55—73 10 Claims

Gas-solid contact method and apparatus, especially apparatus for the adsorption of sulfur oxides from flue gas on a

downwardly moving bed of granular carbon-containing adsorbent, said apparatus being provided with an adsorbent containing vessel having opposed perforate vertical walls for gas flow, each of said walls comprising

a. a vertical row of louvers disposed in a jalousie-type relationship, each of said louvers being inclined upwardly, and outwardly from the axis of the vessel, said louvers being substantially parallel to one another, and

b. a vertical row of baffles arranged at the inner side of said wall adjacent to and behind said louvers, said baffles being substantially parallel to said louvers.



3,708,982

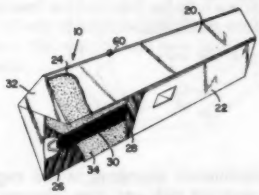
SYSTEM AND BARRIER FOR CONTAINING AN OIL SPILL

Thomas Nicholas Blockwick, McLean, Va., assignor to Ocean Systems, Inc., New York, N.Y.

Filed Oct. 21, 1970, Ser. No. 79,997

Int. Cl. E02b *15/04*

U.S. Cl. 61—1 F **23 Claims**



A system for containing an oil spill comprising a plurality of barrier modules each composed of a composite structure having a buoyant upper section and a water absorbing lower section which represents concurrently the sole ballast for said upper section and the subsurface barrier for the module.

3,708,983

APPARATUS FOR CONFINING OIL SPILLS

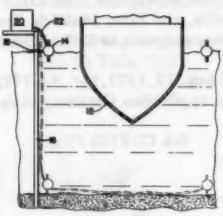
William E. Brown, 132 Milliken Drive, Napa, Calif., and Edmond E. Gilbert, 4990 Alhambra Avenue, Martinez, Calif.

Filed Feb. 16, 1971, Ser. No. 115,603

Int. Cl. E02b *15/04*

U.S. Cl. 61—1 F **8 Claims**

Apparatus comprising a series of air-retaining structural units connected together in a complete loop so that it will float while surrounding a vessel that may be leaking or spilling oil or some other lighter-than-water fluid. All units are hollow and provided with means for releasing the air so that they will submerge to any desired depth and means for resupplying air so that they can be again raised when needed.



3,708,984

TUNNEL LINER JACKING SYSTEM AND METHOD

Fred K. Coleman, Los Alamitos, Calif., assignor to Ameron, Inc., Monterey Park, Calif.

Filed Sept. 15, 1971, Ser. No. 180,604

Int. Cl. E01g *5/14*

U.S. Cl. 61—43 **10 Claims**

A subterranean tunnel is formed by advancing a string of pipe sections behind a rotary boring head. Jacking stations between the respective pipe sections are remote-controlled from the tunnel portal to push the pipe sections forward. The pipe sections are advanced in an incremental jacking program operated by automatic controls. In the preferred jacking sequence, a first group of longitudinally spaced apart pipe sections is simultaneously advanced during the first phase of the sequence, while at least two adjacent jacking stations remain stationary between each adjacent pair of advanced pipe sections. After the first jacking phase, a second group of longitudinally spaced apart pipe sections is simultaneously moved forward against the previously advanced pipe sections of the first group. In a third jacking phase, a third group of longitudinally spaced apart pipe sections is simultaneously moved forward against the previously advanced pipe sections of the second group. The system preferably returns to the first jacking phase, followed by the second phase, the third phase, and so forth, although a fourth phase, or more, can be included in the jacking sequence before the system returns to the first phase. Thus, at least two adjacent pipe sections remain stationary behind each pipe section being advanced to act as a back-up for resisting the tendency of the pipe sections to back out of the tunnel instead of progressing forward.

3,708,985

ARTICULATED MARINE PLATFORM

Ivo C. Pogonowski, and Paul D. Carmichael, both of Houston, Tex., assignors to Texaco, Inc., New York, N.Y.

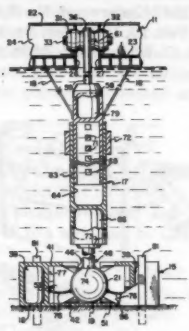
Filed Dec. 7, 1970, Ser. No. 95,663

Int. Cl. E02b *17/00;* **E02d** *27/04;* **B63b** *35/44*

U.S. Cl. 61—46.5 **1 Claim**

The invention relates to a monopad articulated marine structure for offshore waters, which unit comprises an anchoring base, a work platform which is normally positioned above the water's surface, and an intermediate support column. The

latter is operably connected at opposed ends to the respective



base and deck or platform whereby the entire unit can be readily floated to and from working sites.

3,708,986

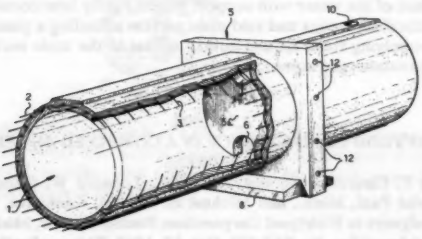
IMMERSIBLE RESERVOIR

Jean Roulet, La Celle Saint Cloud, and Armand Cimadevilla, Neuilly (Hauts de Seine), both of France, assignors to Sea Tank Co., Paris, France

Filed July 31, 1970, Ser. No. 59,911

Int. Cl. E02d *29/06*

U.S. Cl. 61—46 4 Claims



A reservoir, for example, for liquids capable of being immersed under water and being formed of prestressed concrete. The reservoir has a cylindrical body closed at its ends and lying with its axis horizontal. The reservoir is provided with two partitions which extend from the interior of the body outwards and each of which presents a support foot such that the reservoir can be supported on an emplacement under water at only two points along its length, the partitions inside the body are provided with access openings to permit liquid flow past the partitions and the body may also include other partitions which do not extend out of the cylindrical body and which are also provided with openings for liquid flow.

3,708,987

CONCRETE RESERVOIR FOR UNDERWATER USE

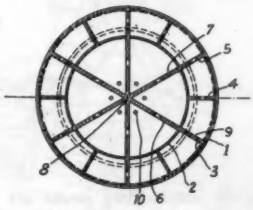
Jean Roulet, 6, Hameau Les Pinsons, 78 La Celle Sain-Cloud, and Armand Cimadevilla, 10 rue Edouard Mortier, Neuilly, both of France

Continuation-in-part of Ser. Nos. 884,584, Dec. 12, 1969, abandoned, and Ser. No. 887,626, Dec. 23, 1969, abandoned. This application July 23, 1971, Ser. No. 165,060

Int. Cl. E02d *27/38*

U.S. Cl. 61—46 10 Claims

A reservoir of prestressed reinforced concrete preferably for storing hydrocarbons, adapted so that it can be submerged in the sea so that it rests freely on the bottom thereof, said reservoir comprising a series of cylindrical walls into which radiating partitions fit so that they bear on a central pillar formed by two circular slabs fitting into the walls and the partitions. The bottom of the reservoir has a reinforcement designed to receive a supporting pad or cushion, and the top of the reservoir carries at least one columnar support having a working platform at its upper end. This platform remains above the surface of the sea after the reservoir has been submerged. Each support is in the form of a hollow shaft and serves to carry means connecting the tank with safety elements on the work platform. Further, each shaft is provided



with first means which allow the tank to be submerged in the sea so that it can rest freely on the bottom thereof and second means which allow the tank to "breath" by enabling the safety elements to be brought into communication with the free atmosphere.

Preferably each shaft has a number of cells therein which can be successively flooded with sea water to lower the reservoir to the sea bottom in stages and desirably the reservoir is made from prestressed reinforced concrete.

3,708,988

FENDER ASSEMBLY

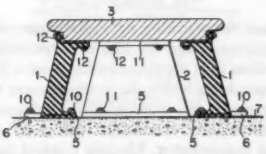
Misao Miura, Yokohama, Japan, assignor to Siebu Gomu Kagaku Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1970, Ser. No. 39,392

Claims priority, application Japan, Sept. 18, 1969, 44/74459

Int. Cl. E02b *3/22*

U.S. Cl. 61—48 1 Claim



A fender assembly to be mounted on the surface of a quay-wall as found in harbors or dockyards comprises two pairs of rubber elements each having a plate like trapezoid shape and a rigid impact receiving plate. The pairs of rubber elements are adapted to be secured on to the surface of the quay-wall so that they form together a frustum of a quadrilateral pyramid widening towards the quay-wall surface. The impact receiving plate is rigidly secured on to the top of the pairs of rubber elements.

3,708,989

BRACKETS FOR SUPPORTING PARTITIONS IN DOCKS

Hisashi Kodama, Tokyo; Tsuneo Sekigawa, Tsu; Kazumi Hata, Tsu, and Akimichi Nakaya, Tsu, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1970, Ser. No. 94,754
Claims priority, application Japan, Dec. 4, 1969, 44/114632
Int. Cl. B63c *1/00*
U.S. Cl. 61—64 6 Claims

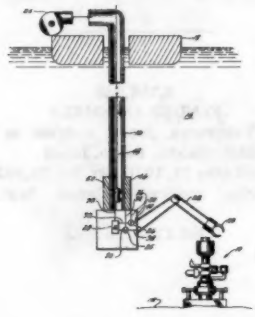
Partitions in the shipbuilding docks are supported by minimum weight brackets specially designed for arbitrary provision of the same in the docks.

3,708,990

DEEP WATER DRILL PIPE CONTROLLED MANIPULATOR

Robert Curtis Crooke, Corona Del Mar, Calif., assignor to Global Marine Inc., Los Angeles, Calif.

Filed Dec. 9, 1970, Ser. No. 96,479
Int. Cl. B63c *11/00*
U.S. Cl. 61—69 R 12 Claims



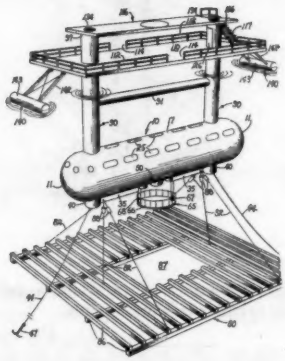
A manipulator for working on underwater oil drilling and production equipment and the like is supported on the lower end of a pendulous drill pipe suspended from a floating vessel. The drill pipe conducts hydraulic motive power to operate the manipulating arms of the manipulator. Hydraulic fluid is distributed by electrically controlled valves in a distribution manifold at the manipulator. Electric control signals are conducted to the control valves by a multi-conductor electric cable which is either secured to the exterior of the drill pipe or disposed within the interior of the pipe. Control signals alternately may be remotely transmitted by a sonar system for producing coded acoustical signals which are decoded at the manipulator and converted to electric control signals for operating appropriate control valves. Some motive power for operating the manipulator may be supplied by an electric cable led down the inside of the drill pipe, with control signals being carried by a low-voltage line either inside the drill pipe or secured to its exterior. The electric control signals may be multiplexed and decoded at the manipulator.

3,708,991

SUBMARINE HOME

William Barkley, 3847 Underwood, No. 3, San Jose, Calif.

Filed Feb. 19, 1971, Ser. No. 116,937
Int. Cl. B63c *11/00*; B63b *35/44*
U.S. Cl. 61—69 15 Claims



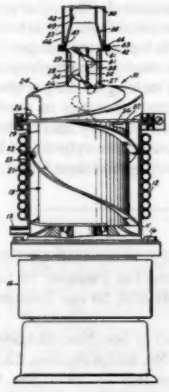
A submarine home adapted to be disposed within a body of water providing a buoyant, watertight main dwelling section having a weighted stabilizing member dependently mounted thereon to moor the main section at a predetermined submerged depth beneath the surface of the water which also serves as an artificial reef for the growth of biological plant life thereon such as seaweed, kelp and the like and including deck means elevationally spaced from said main section above the surface of the water with support means rigidly interconnecting the deck means and said main section affording a passage for supplying fresh air and human access to the main section of the submerged home.

3,708,992

METHOD OF MAKING ICE IN A COMBINED AUGER AND PRESS

Jack F. Clearman, Stevensville, Mich.; Leonard W. Ohlsson, Saint Paul, Minn., and Michael H. Mackin, Kankakee, Ill., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 867,222, Oct. 17, 1969. This application March 3, 1972, Ser. No. 231,498
Int. Cl. F25c *1/14*
U.S. Cl. 62—71 2 Claims



A method of making ice with a combined auger and press wherein a continuous augering step harvests thin films of ice product whereupon the ice product is collected and mechani-

cally transferred from a second stage collection zone to a third stage compression zone. The collected ice product is then compression-augered to remove excess water and to extrude the product in the form of a compacted dehydrated hard ice column, whereupon an obstruction is interposed in the path of movement of the emerging hard ice column to shatter the column into separate pieces of selected utilitarian size and configuration.

3,708,993

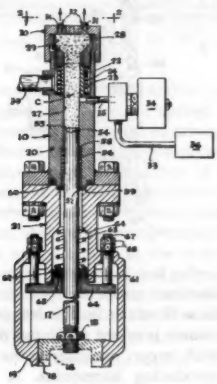
SOLIDIFIED GAS PELLETS AND APPARATUS FOR MANUFACTURING

Robert C. Hardt, Chicago Heights, and Edward Kozlow, Homewood, both of Ill., assignors to Chemetron Corporation, Chicago, Ill.

Division of Ser. No. 660,790, Aug. 15, 1967, abandoned. This application Nov. 12, 1969, Ser. No. 871,277

Int. Cl. F25j *1/00, 3/00*

U.S. Cl. 62—35 **10 Claims**



Carbon dioxide pellets of a high density formed in a manner to break easily into minute pieces yet not agglomerate during shipment, together with a head member for a pellet machine to form pellets of this kind.

3,708,994

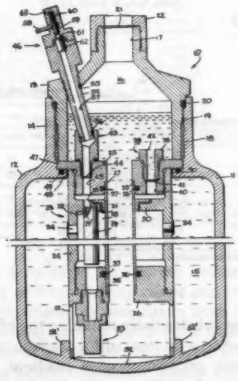
GAS GENERATOR AND CARTRIDGE THEREFOR

Michael Crane, West Orange, N.J., assignor to General Pneumatics Corporation, Orange, N.J.

Filed Feb. 12, 1971, Ser. No. 114,989

Int. Cl. F17c *7/02*

U.S. Cl. 62—50 **21 Claims**



The gas generator includes a heat responsive means which communicates the reaction chamber with the liquified gas in the reservoir in order to pressurize and to flush out the liquified gas from the reservoir as well as a pressure responsive means which communicates the reaction chamber with the aspirating chamber in order to mix the reactive gases of the reaction chamber with the vaporized gas. The cartridge is insertable as a unit into the gas generator housing so as to be readily assembled and replaced.

3,708,995

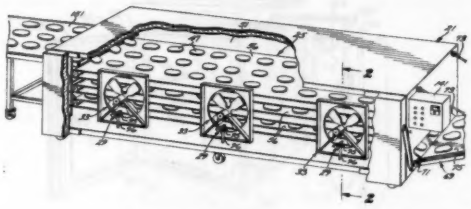
CARBON DIOXIDE FOOD FREEZING METHOD AND APPARATUS

Dennis R. Berg, 10216 Vultee No. 102, Downey, Calif.

Continuation-in-part of Ser. No. 882,662, Dec. 5, 1969, abandoned. This application March 8, 1971, Ser. No. 121,987

Int. Cl. F25d *13/06*

U.S. Cl. 62—63 **20 Claims**



for quick freezing foodstuff consisting of placing the foodstuff on a conveyor for being conveyed through a freezing tunnel; delivering liquid CO_2 to the tunnel and spraying it into such tunnel in gaseous form and circulating the gas in heat exchange relationship with the foodstuff; sensing the temperature in the tunnel and controlling the rate of CO_2 delivered to the nozzle to maintain the temperature in the tunnel in a range slightly above the boiling temperature of CO_2 to thereby effect relatively rapid freezing of the foodstuff moving along the conveyor while preventing solidification of the CO_2 within the tunnel.

3,708,996

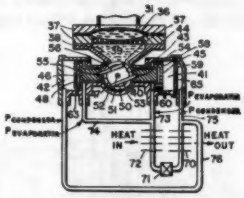
PRESSURE TRANSLATING APPARATUS AND PROCESS

Jaroslav Wurm, 2240 S. 59th Avenue, Cicero, Ill.

Filed June 28, 1971, Ser. No. 157,456

Int. Cl. F25b *1/00*

U.S. Cl. 62—116 **8 Claims**



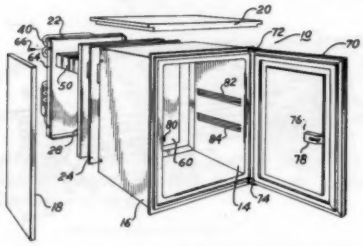
An apparatus and process for conversion of thermal energy into mechanical energy wherein the working fluid of a heat engine is in contact with one side of a pressure sensitive means such as a piston or diaphragm, the other side of the pressure sensitive means being in contact with an incompressible fluid which in turn is in contact with the first ends of a pair of opposing pistons, the pistons being linked by mechanical linkage, the second end of one piston being in contact with a fluid to be pumped and the second end of the second piston being in contact with a cushion chamber, providing a quiet running thermal engine without dynamically unbalanced forces, with substantially reduced influence on the performance and smooth running of the dynamic instability inherent to free-piston systems generally, and with a positive control of the piston

travel. The apparatus is particularly advantageously used in connection with a refrigeration system wherein the backside of the second end of each piston is in contact with the refrigeration fluid at evaporator pressure and the face of the second end of each piston is in contact with the refrigeration fluid at condenser pressure.

3,708,997
REFRIGERATOR STRUCTURE

Thomas M. McLaughlin, Mishawaka, Ind., assignor to American Formed Plastics Corp., Elkhart, Ind.

Filed Dec. 7, 1970, Ser. No. 95,632
Int. Cl. F25d *19/00*
U.S. Cl. 62—449 **9 Claims**

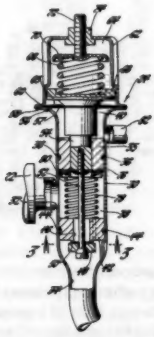


A refrigerator structure in which the housing has a rear and front opening, a removable rear panel closing the rear opening, and a pivoted hinged door closing the front opening. A refrigerating unit is mounted on the rear panel and is removable from the housing along with the rear panel, so that the housing may be inverted for installing the housing as either a right or left door unit while maintaining the refrigerating unit in its upright position.

3,708,998
AUTOMATIC EXPANSION VALVE, IN LINE, NON-PILOTED

Carl A. Scherer, Clarence Center, and Paul K. Beatenbough, Medina, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 5, 1971, Ser. No. 169,300
Int. Cl. F25b *41/00*
U.S. Cl. 62—210 **3 Claims**

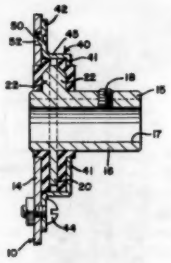


Refrigerating apparatus for an automobile air conditioning system including an expansion valve with a tubular housing separated into a metering and a control portion by a wall separating member and having an inlet between the metering portion and the condenser and an outlet between the metering portion and the evaporator. A valve member and a passage between the inlet and outlet regulates the supply of refrigerant to the evaporator. A diaphragm within the control portion which has one side exposed to refrigerant pressure from the evaporator and the other side exposed to a reference or control pressure within a sealed chamber moves the valve to an open position in response to decreasing refrigerant pressure in the evaporator. This increases evaporator pressure above a predetermined level to prevent frost accumulation on the evaporator.

3,708,999
VIBRATION DAMPING HUB PROPELLER TYPE FANS

Richard F. Beehler, Beach Grove, Ind., assignor to Lau Incorporated, Dayton, Ohio

Filed Dec. 14, 1970, Ser. No. 97,711
Int. Cl. F16d *3/28, 3/52*
U.S. Cl. 64—11 R **5 Claims**

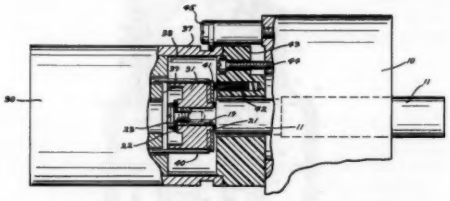


A vibration damping hub is designed especially for use with relatively large diameter propeller-type fans to reduce the transmission of noise from the fan blades, particularly where an electric drive motor is speed regulated through semiconductor devices which impart impulses to the motor and cause undesired noise-producing harmonics. A pair of annular elastomeric blocks are formed with arcuate cut-outs which receive corresponding drive lugs formed on a radial extension of a drive hub. The blade spider is similarly formed with inwardly extending lugs, as is a cap member, which respectively encircle and engage the pair of elastomeric blocks. The arrangement is one in which the drive is accomplished through rotational compression of the blocks without the necessity of axially compressing the blocks.

3,709,000
COUPLING

Erland K. Persson, Minneapolis, Minn., assignor to Electro-Craft Corporation, Hopkins, Minn.

Filed Feb. 8, 1971, Ser. No. 113,572
Int. Cl. F16d *3/78*
U.S. Cl. 64—13 **10 Claims**

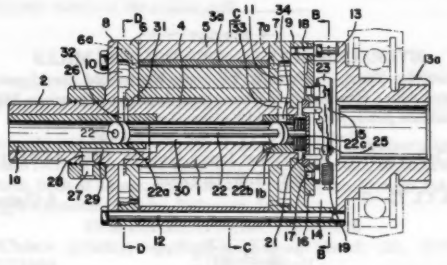


A coupling for substantially reducing the effects of torsional resonance between a motor and a transducer. The coupling utilizes the shear properties of a resilient material over a limited range to reduce the amplitude of torsional resonance and to increase the frequency band in which it may arise.

3,709,001
HYDRAULIC-TYPE FUEL-INJECTION AUTOMATIC TIMER

Shoichi Suzuki, Higashi-Matsuyama-shi, Japan, assignor to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed July 6, 1970, Ser. No. 52,248
Int. Cl. F16d *3/10*
U.S. Cl. 64—25 2 Claims

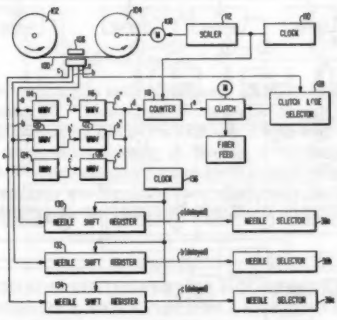


A hydraulic, automatically adjustable timing device for regulating fuel injection. A pair of springs control outward movement of a flyweight responsive to driving shaft speed and hence permit different control characteristics at low and high speeds. The relative angular positions of the driving and driven shafts depend on the relative positions of a casing forming working chambers and a rotor having vanes located in the working chambers, the torque being transmitted through the casing, the rotor and the fluid in the working chambers. a valve member having valve elements with a solid periphery and inclined parallel faces is rotated with the outward movement of the flyweights to control the flow of pressurized fluid to the various portions of the working chamber.

3,709,002
APPARATUS FOR PRODUCING PATTERNED DEEP PILE CIRCULAR KNITTED FABRICS

Robert E. Brandt, Delavan, Wis.; Tony G. Fegeat, Houilles, France, and Patrick J. Forde, Cliftonville, England, assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Aug. 20, 1970, Ser. No. 65,413
Int. Cl. D04b *9/14*
U.S. Cl. 66—9 B 10 Claims

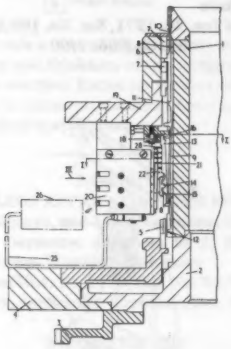


Each head of a multiple feed sliver knitting machine includes a plurality of fiber feeding zones and the knitting needles are selectively raised to take fibers from one or more of such zones. Clutching devices control the quantities of fibers of different colors delivered to each of the zones. Tape controlled patterning means coordinate needle selection and fiber feed to assure the presence in each knitted stitch of the correct amount of pile fibers of the desired color.

3,709,003
PATTERN CONTROL MECHANISMS FOR KNITTING MACHINES

Albert Henry Widdowson, and Sidney Clifford Savage, both of Leicester, England, assignors to Wildt Mellor Bromley Limited, Leicester, England

Filed Oct. 7, 1970, Ser. No. 78,866
Claims priority, application Great Britain, Oct. 22, 1969, 51,824/69
Int. Cl. D04b *15/78*
U.S. Cl. 66—50 R 4 Claims

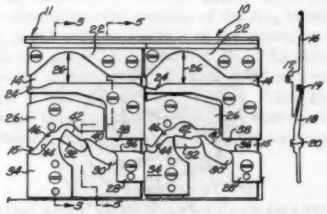


This invention relates to the pattern control mechanisms of knitting machines, particularly circular knitting machines. According to the invention a rocking selector for engagement with pattern butts is mounted for rocking action about an axis parallel with but spaced from the plane of the path of the pattern butts, to move an operating part of the selector between butt-engaging and butt-missing positions, the spacing being such that rocking motion of the selector imparts an essentially short rectilinear motion to an operative part of the selector, which motion is essentially in the plane of the path of the butts. The rocking axis may be inclined to or parallel with the instantaneous path of the butts at the instant of engagement with the operative part when the latter is in butt-engaging position.

3,709,004
CAM BOX FOR KNITTING MACHINE

Horst Paepke, Rottenburg am Neckar, Germany, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Nov. 2, 1970, Ser. No. 86,059
Int. Cl. D04b *9/00*
U.S. Cl. 66—57 4 Claims



A knitting machine cam box construction defines a cam track having upper and lower surfaces and through which the butts of knitting needle-actuating jacks pass. Said construction comprises a first cam means defining an upper surface of the cam track and a second cam means defining the lower surface of the cam track. Said second cam means includes a tuck cam and an up-throw cam located adjacent each other. The second cam means also includes a follower cam and means mounting

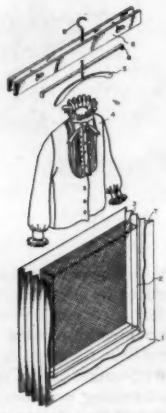
the follower cam for adjusting movement with and in response to adjusting movement of the tuck cam. Moreover, means is provided for simultaneously adjusting the position of the upthrow cam and the stitch cam relative to the tuck cam.

3,709,005

VAPOR-PHASE REACTION APPARATUS FOR TREATING CELLULOSIC TEXTILE MATERIALS AND GARMENTS

Esmond J. Keating, New Orleans; Chester H. Haydel, Metairie, and Nestor B. Knoepfler, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture

Filed Jan. 26, 1971, Ser. No. 109,819
Int. Cl. D06c *1/00*
U.S. Cl. 68—6 **3 Claims**



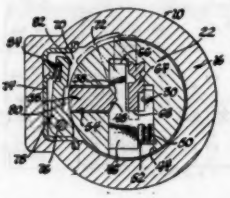
A vapor-phase reaction system (apparatus and method) for treating cellulosic textile materials and garments with vaporizable reagents is disclosed. The cellulosic material or garment to be treated is placed within a skeleton frame adjacent to a matrix which has an extensive surface area on which the reagent is dispersed, and the assembly is confined in an expandable container which has pleated walls to allow for expansion of the gases generated.

3,709,006

CYLINDER LOCK

Edward H. Seidewand, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed July 29, 1971, Ser. No. 167,331
Int. Cl. E05b *15/14, 29/02, 63/00*
U.S. Cl. 70—364 R **3 Claims**



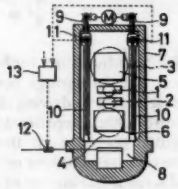
An improved cylinder lock of the side bar type adapted for keyless locking including a stationary sleeve, a core supported on the sleeve for rotation between a locked position and an unlocked position, a side bar on the core movable between a projecting position and a withdrawn position, and a spring biased notched keeper lever pivotally supported in a recess in the sleeve adjacent the core. The recess in the sleeve extends around a portion of the core so that the latter is rotatable between the locked and unlocked positions with the side bar in the projecting position and the keeper lever has a cam surface thereon which is engageable by the side bar when the core is rotated toward the locked position with the side bar in the projecting position, the side bar then momentarily pivoting the keeper lever to permit the core to achieve the locked position wherein the side bar is captured in the keeper notch and rotation of the core in the opposite direction prevented.

3,709,007

HYDRAULICALLY LOADED ROLLING MILLS

Masuhiko Hirai; Toshiharu Takatsu; Kazuyoshi Hashimoto, and Akira Hozoji, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1970, Ser. No. 88,699
Claims priority, application Japan, Nov. 18, 1969, 44/91818
Int. Cl. B21b *37/08*
U.S. Cl. 72—8 **8 Claims**



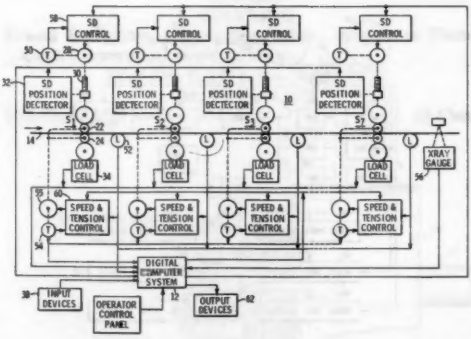
Hydraulically loaded rolling mills wherein the improvement comprises measuring means stretched over a distance between the measuring positions representing the roll gap of a rolling mill for measuring indirectly a change of the roll gup by detecting and signalling the tensile stress originated from elastic deformation of said measuring means.

3,709,008

GAUGE CONTROL METHOD AND APPARATUS FOR METAL ROLLING MILLS

Andrew W. Smith, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 14, 1970, Ser. No. 80,682
Int. Cl. B21b *37/00*
U.S. Cl. 72—8 **26 Claims**



A programmed computer control system provides an on-line roll force gauge control for a multiple stand tandem hot metal strip rolling mill. A gauge control program calculates the workpiece strip delivery gauge error from at least one stand of the rolling mill and from this gauge error determines a required roll opening correction to remove this gauge error. The gauge control program then determines in relation to the magnitude of the delivery gauge error and related roll opening

correction for the same one stand that this delivery gauge error is to be corrected by adjustment of the roll opening of that same one stand or is to be fed forward in the direction of the workpiece strip movement for correction in a succeeding stand of the rolling mill by adjustment of the roll opening of the succeeding stand. The roll opening correction is effective to adjust the latter stand operation for a time interval related to the movement of the workpiece strip increment from the stand where the gauge error is measured to the following correction stand of the rolling mill, assuming the latter stands are adjacent stands of the rolling mill.

3,709,009

METHOD FOR DETECTING ECCENTRICITY AND PHASE ANGLE OF WORKING OR BACKING ROLL IN ROLLING MILL

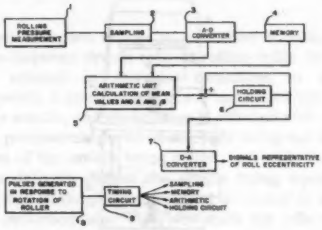
Hiroyuki Shiozaki, Asahi-ku, Yokohama-shi, Kanagawa-ken, and Norio Takahashi, Konan-ku, Yokohama-shi, Kanagawa-ken, both of Japan, assignors to Ishikawojima-Harima Jukogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Oct. 22, 1970, Ser. No. 83,050

Claims priority, application Japan, March 20, 1970, 45/23105

Int. Cl. B21b *37/08*

U.S. Cl. 72—8 **4 Claims**



A method for detecting an eccentricity and phase angle (an angle formed between a predetermined point of a roll and a point at which the maximum eccentricity occurs) of a working or backing roll in a rolling mill without use of detectors directly attached to the peripheral surface of the roll is provided. The rolling pressure is sampled, quantized and fed into an arithmetic unit for calculating the eccentricity and phase angle of the roll based upon the following relations:

$$\Delta P = \frac{\Delta S}{\frac{1}{K} + \frac{1}{M}}, \text{ and}$$

$$\Delta S = A\cos(\omega t - \beta)$$

where ΔP = variation in rolling pressure; ΔS = eccentricity; K = mill constant; M = plastic deformation coefficient; A = eccentricity of a backing roll of for example a four-high rolling-mill stand; ω = angular velocity of the roll; t = time and β = phase angle. The calculated eccentricity and phase angles may be converted into analog quantities which may be used as signals for correcting the variation in thickness of rolled stock.

3,709,010

METHOD FOR AUTOMATICALLY CONTROLLING THICKNESS OF A WORKPIECE IN A ROLLING MILL

Setsuo Tatsumi, Fukuyama-shi, Hiroshima-ken, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

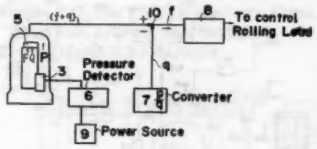
Continuation-in-part of Ser. No. 687,956, Nov. 27, 1967, abandoned. This application Dec. 17, 1970, Ser. No. 99,086

Claims priority, application Japan, Nov. 26, 1966, 41/77256

Int. Cl. B21b *37/08*

U.S. Cl. 72—8 **7 Claims**

A method of controlling the shape and thickness of a strip workpiece in a rolling mill wherein an electrical signal is generated representative of a bending pressure applied to the rolls, another electrical signal is generated as a function of a fixed relation between the bending pressure and a constant and still another electrical signal is generated representative of the total force applied on the backup rolls. The signals representative of said fixed relation and of said total force are



combined to provide a control signal to vary the rolling load to control the shape and thickness of the workpiece to eliminate the effect of the reaction forces on control of the rolls which otherwise tends to cause production of workpieces which do not meet the desired specifications.

3,709,011

RING ROLLING APPARATUS WITH FOUR ROLLS

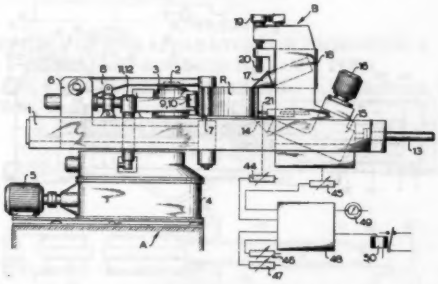
Eugen Wieting, Hamm, and Hans Siepmann, Rhynern-Osttunnen, both of Germany, assignors to J. Banning Aktiengesellschaft, Hamm Westfalen, Germany

Filed Nov. 18, 1970, Ser. No. 90,726

Claims priority, application Germany, Dec. 5, 1969, P 19 61 260.3

Int. Cl. B21b *5/00*

U.S. Cl. 72—10 **8 Claims**



The specification describes a ring rolling apparatus with a pair of rollers for rolling the cylindrical faces of a ring and with a pair of conical upsetting rolls for rolling the radial ring faces. The pair of upsetting rolls is arranged to be displaced automatically in accordance with the increase in size of the outer ring diameter owing to the displacement of a feeler roller sensing this diameter. The sensing roll and the upsetting stand are respectively connected with an actual value indicating means which determines the position of the ring in relation to the upsetting stand and the position of the upsetting stand in relation to the roll stand. The output signals of the actual value indicating means are arranged to be supplied to a switching means, which is connected with a target value indicating means and, when the actual and target value correspond, is arranged to actuate a relay for taking off the roll pressure.

3,709,012

HOT ROLLING MILL LUBRICATION APPARATUS AND PROCESS

Louis C. Larsonneor, Palos Heights, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

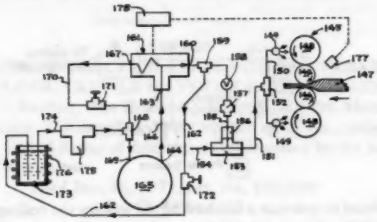
Continuation-in-part of Ser. No. 817,377, April 18, 1969, abandoned. This application Jan. 4, 1971, Ser. No. 103,641

Int. Cl. B21b *37/00, 27/10, 45/02*

U.S. Cl. 72—21 **9 Claims**

A method and apparatus for applying hot rolling mill lubricants composed of water and difficulty dispersible oil to the rolls of rolling stands used to reduce hot steel whereby the

lubricant is applied only during the period when the workpiece contacts the rolls of the rolling stands. The oil is continuously circulated in a loop system to maintain it at a desired



temperature range, and then admixed with water when a rolling stand calls for lubrication. Water is preferably continuously fed to the rolls for cooling.

3,709,013

EXTRUSION PRESS FOR ROD OR TUBE

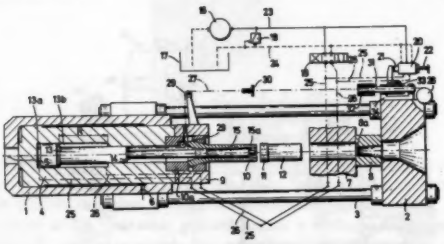
Ernst Petsch, Mettmann, Germany, assignor to Maschinenfabrik Sack GmbH, Dusseldorf-Rath, Germany

Filed May 19, 1970, Ser. No. 38,826

Claims priority, application Germany, May 29, 1969, P 19 27 396.2

Int. Cl. B21j *7/26;* B21c *23/20*

U.S. Cl. 72—22 **6 Claims**



A hydraulic rod and tube extrusion press having a main extrusion ram and a piercer connected to a piston which works in a cylinder within the extrusion ram. In order to extrude tube around the piercer with the tip of the piercer stationary in the mouth of the die means are provided for supplying fluid to the return stroke chamber of the piercer piston cylinder so that the piercer is retracted at an appropriate rate relatively to the extrusion ram as the extrusion ram advances.

3,709,014

PRESS FOR HYDROSTATIC EXTRUSION

Torstein Landa; Pertti Syvakari, and Erik Westman, all of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

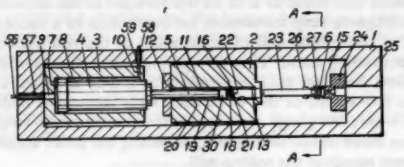
Filed April 28, 1971, Ser. No. 138,201

Claims priority, application Sweden, April 30, 1970, 6010/70

Int. Cl. B21c *23/08*

U.S. Cl. 72—60 **6 Claims**

A press for hydrostatic extrusion includes a press stand and a high pressure cylinder displaceable in the stand. A punch is mounted for movement into the high pressure cylinder to produce the extrusion pressure therein. The billet and die are positioned by a manipulating arrangement between the open end of the high pressure cylinder and a die support, and the cylinder is moved over the billet and die. Pressure fluid is then introduced through the die support and die into the pressure chamber, flow of the fluid out of the chamber being prevented by a valve arrangement or by seating of the billet against the



die. The punch is then advanced into the pressure cylinder to produce extrusion.

3,709,015

TOOL FOR THE CHIPLESS WORKING AND DEBURRING OF GEARS

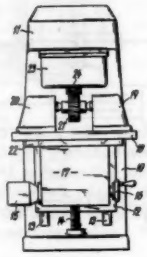
Herbert Loos, Munich, Germany, assignor to Carl Hurth Maschinen-und Zahnradfabrik, Munich, Germany

Filed Oct. 6, 1970, Ser. No. 78,454

Claims priority, application Germany, Oct. 8, 1969, G 69 39 109.9; Feb. 5, 1970, G 70 04 013.0

Int. Cl. B21h *5/02*

U.S. Cl. 72—71 **8 Claims**



A tool for chiplessly roll forming teeth on a workpiece wherein the edges between the tooth surfaces and the top lands are sharp so that burrs otherwise created on the workpiece dedendum are removed.

3,709,016

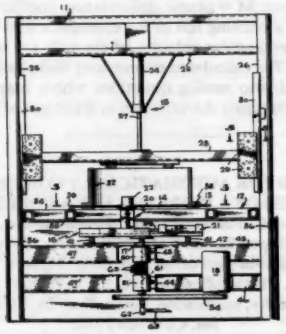
SHEET METAL FORMING MACHINE

George M. Breidert, Granada Hills, Calif., and Albert W. MacCorkell, Sun City, Ariz., assignors to said Breidert by said MacCorkell

Filed Nov. 4, 1970, Ser. No. 86,677

Int. Cl. B21d *19/04*

U.S. Cl. 72—123 **9 Claims**



A machine with a motor-driven rotary table carrying a forming toolholder movable radially of the axis of rotation of

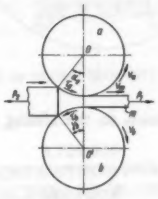
the table by a fluid ram, together with a work support adjacent the table and means for holding an apertured worksheet in place on the support to receive a tool mounted in the toolholder.

3,709,017

METHOD OF ROLLING METAL SHEET ARTICLES BETWEEN THE DRIVEN ROLLS OF THE ROLL MILL

Vladimir Nikolaevich Vydrin, ulitsa Svobody, 139, kv. 7, and Leonid Matveevich Ageev, ploschad MOPRa, 2, kv. 33, both of Chelyabinsk, U.S.S.R.

Filed June 26, 1969, Ser. No. 836,851
Int. Cl. B21b *39/08, 1/00*
U.S. Cl. 72—205 2 Claims



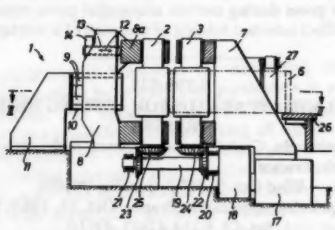
The present invention relates to a method of rolling metal sheet articles between driven rolls of rolling mills, the driven rolls being rotated in opposite directions at different peripheral speeds. A stretching strain is applied to the delivery section of the article, and the process is effected with the ratio between the peripheral speeds of the rolls being not less than the reduction of the article being rolled, and with the rate of travel of the delivery end of the article being equal to the peripheral speed of the driving roll that is rotated at a greater speed. The invention also discloses mills for effecting the present method, which are provided with means for insuring the required ratios between the peripheral speeds of the rolls.

3,709,018

METHOD OF AN ANNULAR-STRIP ROLLING MILL FOR ROLLING OUT AN ENDLESS STRIP FROM A CAST RING

Hans Werner Hox, Weyerstr. 2, and Werner Bechem, Wevelinghovener Str. 7, both of Cologne, Germany

Filed Sept. 22, 1970, Ser. No. 74,372
Int. Cl. B21d *19/14*
U.S. Cl. 72—111 7 Claims



A strip rolling mill apparatus as well as a method is provided for rolling out an endless strip from a cast ring which may be produced by casting an end, continuous casting or centrifugal casting. In this method of rolling an endless strip from a cast ring, the cast ring in one embodiment of the invention is vertically on end while being rolled out to the strip.

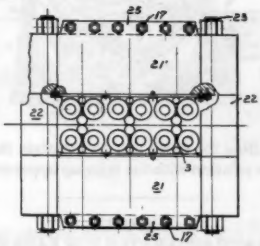
The annular-strip rolling mill consists basically of at least one pair of live rolls and one pair of drawing rolls which are displaceable by a drawing carriage. The live rolls and the drawing rolls, with pertaining brackets therefor, are disposed vertically on end and supported. A roll table, spherical table or the like which extends over the range of displacement of the drawing rolls is provided for the support of the ring or strip being rolled.

3,709,019

BEAM BACKED CLUSTER MILL

Tadeusz Sendzimir, P.O. Box 1350, Waterbury, Conn.

Filed Feb. 3, 1970, Ser. No. 8,380
Int. Cl. B21b *29/00*
U.S. Cl. 72—242 7 Claims



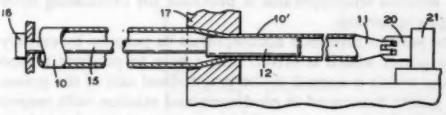
A beam backed cluster mill, wherein deflections of the beams are substantially eliminated by (1) eliminating the horizontal components of the roll separating forces by the provision of multiple saddle blocks, wherein such horizontal components cancel each other, and (2) by prestressing the backing beams by means of moments which oppose the moments generated by the roll separating forces.

3,709,020

METHOD OF AND APPARATUS FOR PRODUCING A STRAIGHT BORE COLD DRAWN TUBE

Sidley O. Evans, Beaver Falls, Pa., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed May 14, 1970, Ser. No. 37,243
Int. Cl. B21c *1/24*; B21b *17/02*
U.S. Cl. 72—283 2 Claims



An arrangement of apparatus for producing a straight bore cold drawn tube, where the internal surface of the finished tube has a minimum of surface wave. This is accomplished by extending the mandrel to a selected position downstream of the die, and limiting the stiffness ratio between tube and mandrel.

3,709,021

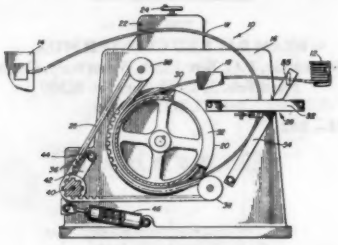
STRAND PROCESSING APPARATUS

Arthur E. Jackman, Simsbury, Conn., assignor to Jackman-Conlin Associates, Inc., Simsbury, Conn.

Filed June 25, 1970, Ser. No. 49,842
Int. Cl. B21c *1/02*; B21b *37/00*
U.S. Cl. 72—289 13 Claims

A wire drawing machine for continuously drawing a strand of wire received from a pay-off apparatus and advancing it along a generally predetermined path toward a take-up apparatus. The machine includes a draw box, a capstan for drawing the strand through the draw box, a drive unit for rotating the capstan, and a compensating mechanism including an endless cogged belt supported on cogged sheaves to run in positive timed relation therewith and in contact with a continuous arcuate portion of the strand on the capstan to maintain the strand in driving engagement with the capstan. The compensating mechanism also includes a control device

responsive to deviation of the strand from its predetermined



path for controlling the drive unit to maintain the machine in timed operative relation with the take-up apparatus.

3,709,022

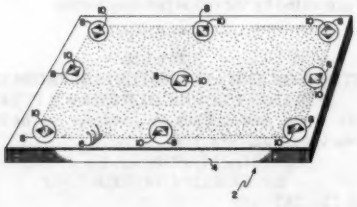
METHOD AND APPARATUS FOR FABRICATING IMAGING MEANS

Robert P. Forsyth, Carlisle, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 22, 1970, Ser. No. 83,028

Int. Cl. B21d *11/04*; B21j *9/18*

U.S. Cl. 72—311 **20 Claims**



A method and apparatus is provided for fabricating novel imaging apparatus.

The subject invention accomplishes its purpose by employing a graver which is driven into a base to produce a facet therein which is normal to the longitudinal axis of the graver. The graver is secured in predetermined relation with respect to a pair of points and is caused to traverse the surface of said base until a desired portion thereof is sufficiently covered with said facets. One of said pair of predetermined points corresponds to a point source of illumination or other electromagnetic radiation and the other of said pair of predetermined points corresponds to a point to which it is desired to reflect any electromagnetic radiation incident on said faceted base from said point source.

3,709,023

AUTOMATIC BENDING AND/OR PUNCHING MACHINES FOR PRODUCING SHAPED PARTS FROM WIRE OR STRIP

Horst Thode, Wallbach, Germany, assignor to Heinz Finzer KG., Wallbach, Germany

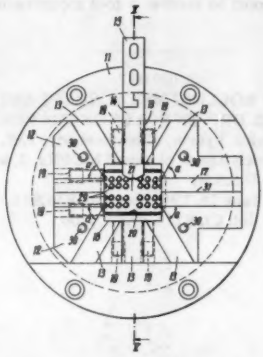
Filed June 10, 1970, Ser. No. 45,032

Claims priority, application Germany, June 16, 1969, P 19 30 450.8

Int. Cl. B21d *41/00*

U.S. Cl. 72—402 **2 Claims**

An automatic bending and/or punching machine for the production of shaped parts from wire or strip by means of tools grouped around a central work place of a support table and connected to driven sliding carriages for movement in relation to the central work place, wherein a tool carrying plate with guide channels for accommodation of the tools is provided co-axially with the work place and means is provided



for connecting the tools to the sliding carriages in a form locking manner.

3,709,024

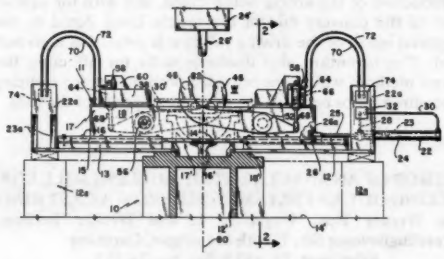
FORMING PRESS FIXTURE

Ranoldo H. Grimoldi, Napa, Calif., assignor to Kaiser Steel Corporation, Oakland, Calif.

Filed April 28, 1971, Ser. No. 138,126

Int. Cl. B21j *13/10*; B21d *9/05*

U.S. Cl. 72—420 **9 Claims**



An improved forming press fixture for selectively engaging, centering and balancing a workpiece upon and relative to the bed of the press during certain sequential press operations in order to effect selected folding or creasing of a workpiece.

3,709,025

METHOD AND APPARATUS FOR FEEDING HIGH SPEED PRESSES

Marcel Laurencin, Castelsarrasin, France, assignor to Cegedur GP, Paris, France

Filed Oct. 9, 1970, Ser. No. 79,494

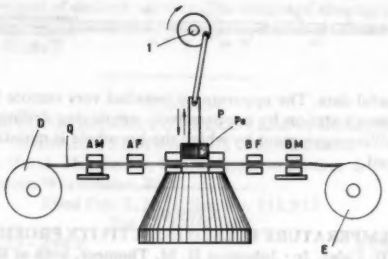
Claims priority, application France, Oct. 16, 1969, 6935463

Int. Cl. B21d *43/02*, *43/10*

U.S. Cl. 72—421 **7 Claims**

This invention is addressed to a new and improved method for automatic precision feeding of high speed presses for mechanically working metal strips in which the metal strip is fed to the press in a precise longitudinal position relative to the die stamp with recovery of elongation due to the effect of the die stamp wherein the strip is gripped between the jaws of at least two movable grips, one above the press and the other below the press in the direction through which the strip is advanced, whereby the movable grips are displaced to advance the strip and the strip is then gripped by at least two fixed grips, one above and another below the press, while the movable grips are displaced to their starting position in which the

fixed grips below the press open before the movable grips close while the fixed grip above the press opens as the mova-



ble grips have closed to permit recovery of the elongation of the strip.

3,709,026

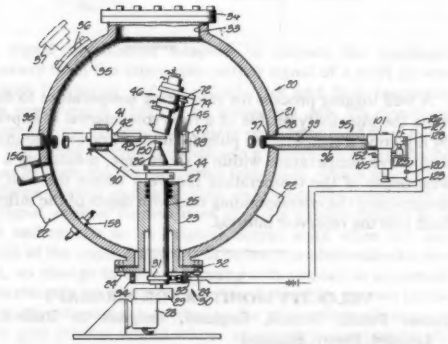
APPARATUS AND METHOD FOR SIMULATING SPACECRAFT EROSION

Barry V. Rhodes, Canoga Park, and Daniel E. Bloxsom, Los Angeles, both of Calif., assignors to KMS Industries, Inc., Ann Arbor, Mich.

Filed Nov. 12, 1968, Ser. No. 774,754

Int. Cl. G01n *3/08*

U.S. Cl. 73—12 **41 Claims**



An apparatus and method for simulating erosion on a spacecraft surface by impact with particulate in a preselected environment. The apparatus and method are ground-based and have the capabilities of simulating all significant environment conditions for a complete trajectory on different test objects including pressure, temperature, heat transfer attitude, altitude, wind and skin friction loads, relative velocity during impact with particulate including successive and cumulative effects of collision with a variety of particulate including dust, micrometeorites, vapor, ice, rain, snow and others. Cumulative test effects can be produced in rapid succession and individually observed and recorded under desired appropriate space environmental conditions selected as desired and, if preferred, under arbitrarily chosen severe conditions. If so elected, a given test may be continued to the point of total destruction of the test object. The equipment includes unique means for generating desired temperatures on the test object, a unique system for simulating particulate in space and for accelerating different kinds thereof in succession to desired velocities to and including hypersonic and for colliding the same with the test object while recording the produced effects of collision.

3,709,027

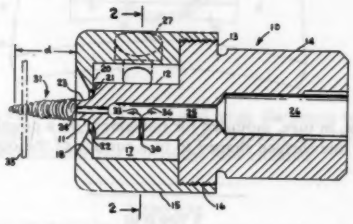
PROXIMITY SENSING DEVICE

Basil B. Beeken, New Haven, Conn., assignor to Automatic Switch Co., Florham Park, N.J.

Filed Jan. 22, 1971, Ser. No. 108,875

Int. Cl. G01b *13/12*

U.S. Cl. 73—37.5 **6 Claims**



A proximity sensing device employing a fluid sensing jet which follows a helical path and which generates an above-ambient pressure signal when interrupted.

3,709,028

CIGARETTE INSPECTION SYSTEMS

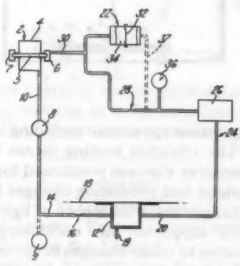
Eryk Stefan Doerman, London, England, assignor to Molins Limited, London, England

Filed Jan. 20, 1971, Ser. No. 108,072

Claims priority, application Great Britain, Feb. 27, 1970, 9,669/70

Int. Cl. G01m *3/00*

U.S. Cl. 73—38 **18 Claims**



A cigarette testing system includes a wrapper tester for detecting leaks in the wrappers of the cigarettes, means operated by the wrapper tester for ejecting faulty cigarettes, and means for testing the porosity of the web of wrapper material before it is formed into cigarette wrappers, the porosity tester comprising means for passing air through the wrapper web to generate a pressure signal dependent upon the degree of porosity of the wrapper material, and a pipe for conveying the pressure signal via a reservoir to the wrapper leak detector to provide compensation for the varying porosity of the wrapper material.

3,709,029

ULTRASONIC INSPECTION APPARATUS

Michael J. Hurwitz, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

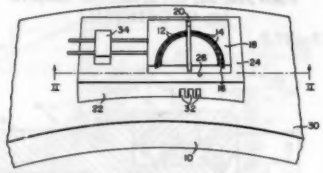
Filed Dec. 17, 1969, Ser. No. 885,813

Int. Cl. G01n *29/04*

U.S. Cl. 73—67.8 R **8 Claims**

A multiple transducer probe for pulse-echo ultrasonic testing, and especially for image-forming at depth within objects, comprising a transducer system focused along a line and having its component transducers situated along an arc of a circle.

Separate transmitting and receiving transducers are preferably mounted covering end-to-end quadrants of a conical depression machined in a metallic transducer block. The transducer



block is, in turn, mounted for movement on a coupling block having one surface shaped to fit a surface of the object to be tested.

3,709,030

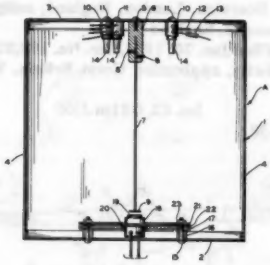
VIBRATION DETECTION APPARATUS

Edward C. Aselman, Jr., High Ridge, Mo., assignor to TNE Incorporated, High Ridge, Mo.

Continuation-in-part of Ser. No. 684,768, Nov. 21, 1967, abandoned. This application May 27, 1970, Ser. No. 40,789

Int. Cl. G01h *1/00*

U.S. Cl. 73—71.1 **22 Claims**



Vibration responsive apparatus including novel vibration sensing means. The vibration sensing means includes a light source, a light-sensitive element positioned for receiving light from the light source and producing changes in electron flow in response to changes in the incidence of light thereon, and a movable member supported for oscillatory movement in response to vibration to cause changes in the incidence of light on the element to an extent dependent upon the magnitude of the vibration. Circuit means produces a first signal in response to said changes in electron flow, the signal amplitude varying with the magnitude of vibration. Voltage comparing means algebraically compares the magnitude of the pulsating signal with a preselected reference potential and delivers an output signal when the algebraic sum of the magnitude of the pulsating signal and the reference potential crosses a predetermined threshold voltage. Control means is operative in response to an output signal from the voltage comparing means to perform a control function at a preselected magnitude of vibration.

3,709,031

MEANS FOR DETERMINING THE SHEAR STRENGTH OF EARTH IN SITU

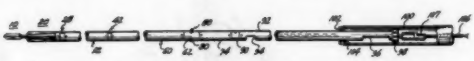
Stanley D. Wilson, 3668 Albion Place North, Seattle, Wash., and Richard K. Harris, 7321 48th Ave. N.E., Seattle, Wash.

Filed July 2, 1970, Ser. No. 51,997

Int. Cl. G01n *3/24*

U.S. Cl. 73—101 **3 Claims**

Apparatus and a technique for the in situ measurement of the torsional shear strength of remotely located soil is provided. A probe and a reaction in close proximity to each other are embedded in soil in place at a remote point, e.g., the end of a bore hole; torque is applied to the probe, and resistance to rotation of the probe in the soil relative the reaction anchored to the soil is sensed and transmitted electrically to the surface



as useful data. The apparatus is installed very remote from an operator's station by cooperatively employing drilling casing or drilling equipment by which the bore hole is maintained or formed.

3,709,032

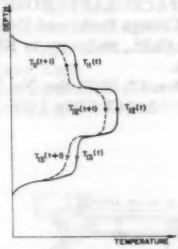
TEMPERATURE PULSED INJECTIVITY PROFILING

Roy D. Coles, Jr.; Johannes H. M. Thomeer, both of Houston, and Curtis A. Chase, Jr., Pearland, all of Tex., assignors to Shell Oil Company, New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,728

Int. Cl. E21b *47/10*

U.S. Cl. 73—154 **5 Claims**



A well logging process for measuring temperature to determine the injectivity profile of a reservoir interval is improved by injecting a temperature pulsing fluid of known amount and distinctive temperature within a short time, measuring a rate with depth of the temperature recovery within the well, and determining the corresponding rate with depth of the inflow of fluid into the reservoir interval.

3,709,033

VELOCITY MONITOR FOR AIRCRAFT

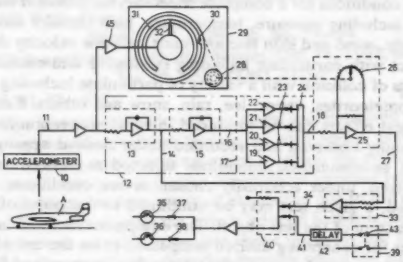
James Pollitt, Bristol, England, assignor to Rolls-Royce Limited, Derby, England

Filed Oct. 19, 1970, Ser. No. 82,052

Claims priority, application Great Britain, Oct. 21, 1969, 51,510/69

Int. Cl. G01c *21/10*

U.S. Cl. 73—178 T **4 Claims**



This invention pertains to a velocity monitor for an aircraft wherein a signal is given if, during the ground-roll of a take-

off, the actual velocity falls below that necessary for successful take-off. To this end there is provided in series connection an accelerometer, a first and a second integrator, a function generator and a comparator for the first integral being a signal of actual velocity and the output of the function generator being a signal of desired velocity. The output of the comparator shows whether actual velocity is above or below the desired velocity.

3,709,034

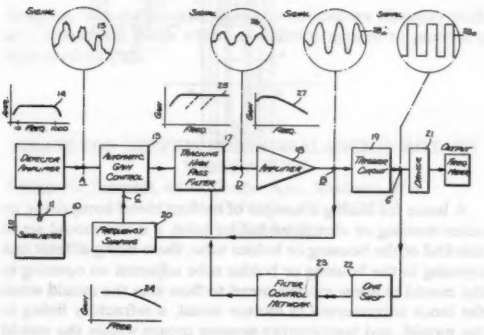
SIGNAL CONDITIONER FOR RECOVERING DOMINANT SIGNALS FROM SWIRL-TYPE METERS

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Feb. 2, 1971, Ser. No. 111,913

Int. Cl. G01s *1/00*

U.S. Cl. 73—194 B **8 Claims**



A signal conditioner adapted to extract the dominant frequency from the composite output signal of a swirl or vortex type flowmeter and to exclude low and high frequency noise components whereby by measuring only the dominant frequency, one obtains an accurate reading of fluid flow quantity. The signal conditioner includes a square-wave-generating trigger to generate the measuring frequency, which trigger undergoes a change in output state only when the amplitude of the signal applied thereto rises above a predetermined high level and reverts to its original output state when the amplitude of the applied signal falls below a predetermined lower level, no change in state occurring with respect to amplitude fluctuations lying within the window defined by the two levels. The composite signal is applied to the trigger through an automatic gain control circuit whose attenuation is automatically changed as a function of frequency whereby the amplitude of the composite signal applied to the trigger is greatest when the dominant frequency thereof is at the high end of the operating range, thereby effectively broadening the window for low operating frequencies and narrowing the window for high operating frequencies to effect low-frequency noise rejection at high operating frequencies and high-frequency noise rejection at low operating frequencies.

3,709,035

FLOW LEVEL SENSING SYSTEM WITH FLOW ELECTRICAL TRANSDUCER, AND ITS APPLICATION

Jan Richard Peter De Fries, Hirschwiesenstrasse 9, 8000 Zurich, and Erwin Josef Tresch, Industriestrasse 20, 8117 Fallanden, both of Switzerland

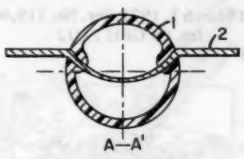
Filed Dec. 15, 1970, Ser. No. 98,331

Claims priority, application Switzerland, Dec. 24, 1969, 19233/69

Int. Cl. G01f *1/00*

U.S. Cl. 73—204 **7 Claims**

A flow rate sensing system with a flow-electrical transducer for the monitoring of the flow of a medium by at least one electrically heatable resistance wire which is incorporated directly into the thermoplastic flow channel wall, the resistance wire has areas of small and large diameters with the small diameter portion in the flow channel and the large diameter imbedded in the wall of the flow channel.



3,709,036

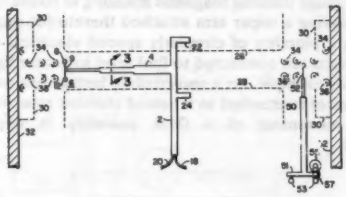
FLUID TURBULENCE STUDY APPARATUS AND METHOD

Richard G. Schwind, LaHonda, Calif., assignor to Nielsen Engineering and Research Corporation

Filed Aug. 31, 1970, Ser. No. 68,310

Int. Cl. G01m *9/00*

U.S. Cl. 73—147 **15 Claims**



A rotating arm carrying vortex generators generates outwardly spiralling vortices in a fluid-medium. Measurements are made in the fluid disturbances caused by the vortices.

3,709,037

FLOWMETERS

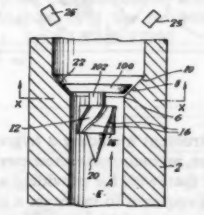
William Edward Abbotts, Foxton, near Royston, England, assignor to B. Rhodes & Son Limited

Filed Oct. 23, 1970, Ser. No. 83,304

Claims priority, application Great Britain, Oct. 23, 1969, 52,025/69; April 28, 1970, 20,347/70

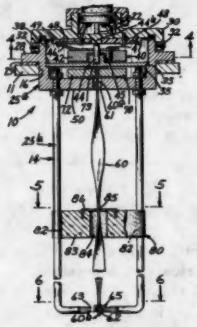
Int. Cl. G01f *1/10*

U.S. Cl. 73—231 **8 Claims**



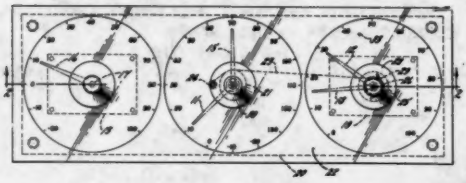
A flowmeter is comprised of a housing with a cavity through which fluid may flow. A rotor is disposed in the cavity, is wholly supported by fluid when it flows through the cavity and is rotated by interaction with the fluid flowing through the cavity.

3,709,038
LIQUID LEVEL INDICATOR
Gerald L. Werner, 273 Westview Dr., Apt. 212, West Saint Paul, Minn.
Filed March 1, 1971, Ser. No. 119,460
Int. Cl. G01f 23/12
U.S. Cl. 73—313 6 Claims



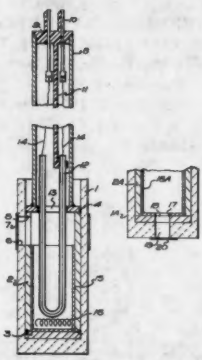
A fuel gauge utilizing magnetic coupling to rotate a follower magnet having a wiper arm attached thereto for sequentially engaging a plurality of circularly spaced electrical contacts. The contacts are connected to fuel level indicator lights positioned, for example, on a snowmobile instrument panel. The drive magnet is attached to a helical element rotatable by the vertical movement of a float assembly in engagement therewith.

3,709,039
COMFORT HUMIDITY INDICATOR
Ralph H. Preiser; Clarence J. Goodwin, both of Peru, and Robert D. Cofoid, Tonica, Ill., assignors to General Time Corporation, Phoenix, Ariz.
Filed Aug. 31, 1970, Ser. No. 68,072
Int. Cl. G01n 19/10; G01w 1/04
U.S. Cl. 73—336 7 Claims



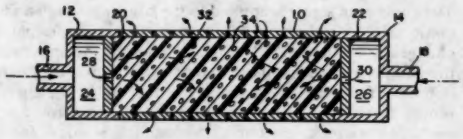
A weather instrument including a hygrometer and an outdoor thermometer, an indoor thermometer, and means operatively associated therewith for providing an indication of the relative humidity required to maintain a predetermined temperature-humidity relationship. In one embodiment, a camfilament arrangement responds to a manual positioning, in accordance with information derived from integral measuring devices, to automatically provide an indication of the relative humidity required to maintain a predetermined temperature humidity relationship. The deviation between ambient and optimum humidity is ascertained by comparison of the coaxially mounted instruments indicating these two conditions.

3,709,040
LANCES FOR TAKING SAMPLES OF MOLTEN METAL
Charles David Coe, Dronfield, Sheffield, England, assignor to Land Pyrometers Limited
Filed Nov. 17, 1970, Ser. No. 90,291
Claims priority, application Great Britain, Nov. 28, 1969, 58,274/69
Int. Cl. G01n 25/04; G01k 1/14
U.S. Cl. 73—354 2 Claims



A lance for taking a sample of molten metal comprising an outer-housing or elongated holder tube, a metal mould set at one end of the housing or holder tube, there being at least one opening in the housing or holder tube adjacent an opening in the mould to allow molten metal to flow into the mould when the lance is immersed in molten metal, a refractory lining to the mould, and temperature-sensing means within the mould adapted to record the liquidus arrest temperature of the sample within the mould.

3,709,041
FLUERIC ACCELEROMETER
Lawrence S. Galowin, Upper Saddle River; Michael J. De Santis, Lyndhurst, and Cary Miller, Rockaway, all of N.J., assignors to Singer-General Precision, Inc., Little Falls, N.J.
Filed May 4, 1970, Ser. No. 34,212
Int. Cl. G01p 15/02
U.S. Cl. 73—515 6 Claims

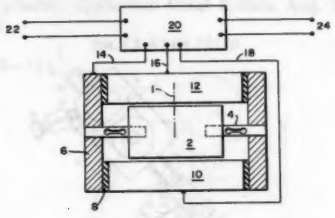


A flueric accelerometer wherein a a FLOW path for pressurized fluid is established through a porous housing, which flow is resisted by a deformable porous matrix comprised of solid material in proportion to acceleration. The housing is adapted to permit measurement of the resistance and therefore the acceleration.

3,709,042
CAPACITANCE ACCELEROMETER
Shih-Ying Lee, and Yao Tzu Li, both of Huckleberry Hill, South Lincoln, Mass.
Filed May 14, 1969, Ser. No. 824,566
Int. Cl. G01p 15/02
U.S. Cl. 73—516 R 12 Claims

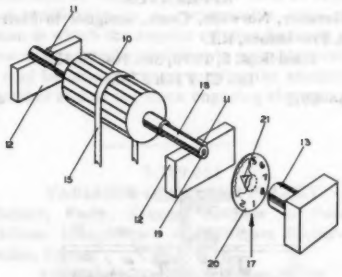
The mass of a seismic suspension serves as the center plate of a balanced differential capacitor suitable for use in an open

loop accelerometer system. The flexures constrain the seismic mass to motion in one direction. The trapped gas between the plates of the differential capacitor provides squeezed film



damping. The differential capacitor modulates circuitry such as a differential pulse width modulation system to provide a high-level output.

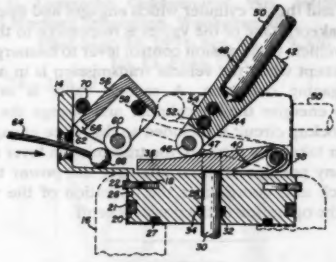
3,709,043
MEANS FOR DETERMINING UNBALANCE IN ROTARY WORKPIECES
William G. Schmidt, 4733 Shaffer Ave., Madison, Wis.
Filed May 11, 1970, Ser. No. 36,353
Int. Cl. G01m *1/08*
U.S. Cl. 73—466 **2 Claims**



A disc shaped indicia bearing reference target with a conically shaped permanent magnet adapted to be received in a centering hole of a ferromagnetic rotary workpiece to be balanced on a balancing machine wherein the target may be quickly affixed and removed and be repeatedly used.

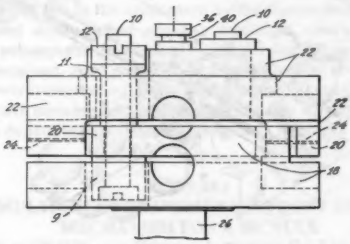
3,709,044
TRIGGER MECHANISM FOR GAS VALVING APPARATUS
Joseph Chacko, San Francisco, Calif., assignor to Sargent Industries, Inc., Los Angeles, Calif.
Continuation of Ser. No. 801,640, Feb. 24, 1969, abandoned. This application Aug. 31, 1970, Ser. No. 68,512
Int. Cl. F16k *31/524*
U.S. Cl. 74—2 **22 Claims**

A triggering mechanism for a gas valving apparatus including a lever for displacing the valve poppet into its off position, an arming cam for applying force to the lever and a triggering cam for locking the lever in the poppet off position. The mechanism is armed by rotating the arming cam into poppet displacing engagement with the lever and then rotating the pull-cable actuated triggering cam into engagement with the



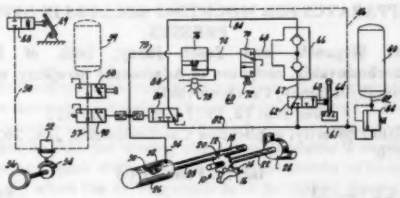
lever to lock the poppet in the off position. Tension applied to the pull-cable releases the lever and allows the poppet to open.

3,709,045
UNIVERSAL JOINT FLEXURE ASSEMBLY
Walter J. Krupick, Succasana, and Richard F. Cimera, Fairfield, both of N.J., assignors to The Singer Company, Little Falls, N.J.
Filed Oct. 14, 1971, Ser. No. 189,110
Int. Cl. G01c *19/18*
U.S. Cl. 74—5 F **5 Claims**



A universal joint gyroscope flexure hinge assembly is provided for a free rotor gyroscope, and which interconnects the rotor, or inertial flywheel, of the gyroscope to the motor-driven spin shaft thereof. The flexure hinge assembly of the invention is constructed so that it may be readily adjusted to compensate for spring restraint and unbalances which cause rectified drift errors in the gyroscope.

3,709,046
POWER TAKEOFF INTERLOCK
Norman W. Mueller, Plainfield, Ill., assignor to Milwaukee Boiler Manufacturing Co., Milwaukee, Wis.
Filed May 24, 1971, Ser. No. 146,085
Int. Cl. F16h *37/00*
U.S. Cl. 74—15.86 **9 Claims**



A power takeoff interlock prevents engagement of a transmission driven power takeoff except when the vehicle trans-

mission drive gear is stationary, thereby preventing damage to both the power takeoff and the transmission. A pair of series connected control valves are interposed between the vehicular air tank and the air cylinder which engages and disengages the power takeoff. One of the valves is responsive to the position of the vehicle transmission control lever to deenergize the interlock except when the vehicle transmission is in a power takeoff engaging condition. A second valve is manually operated to energize the air cylinder and engage the power takeoff. A lockup circuit is included so that once engagement of the power takeoff is secured, the transmission lever may be moved to any position without affecting the power takeoff. The interlock also coordinates the operation of the vehicle brake with the operation of the power takeoff.

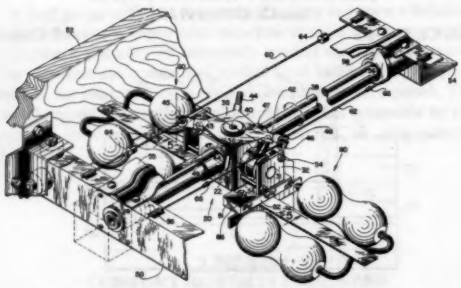
3,709,047
LINEAR ACTUATOR SYSTEM WITH REVERSING MEANS

Wenzel Zaruba, East Paterson, and Jan Sehnal, Upper Saddle River, both of N.J., assignors to Textol Systems, Inc., Carlstadt, N.J.

Continuation-in-part of Ser. No. 50,620, June 29, 1970. This application Jan. 21, 1971, Ser. No. 108,490

Int. Cl. F16h *21/16*

U.S. Cl. 74—25 **10 Claims**



A linear actuator system with reversing means including a housing with a lateral opening to receive a rotating shaft that passes through the opening. A plurality of wheels are disposed against the shaft for initiating and controlling linear movement of the housing with respect to the rotating shaft, with the wheels being resiliently urged against the shaft. When the housing approaches either end of the shaft, it is caused to reverse and move in the opposite direction by means of contact with one or more studs located on wires that pass through the housing with stud contact causing a control member to be pivoted and thereby reverse the direction of the wheels. This in turn causes a reversal of movement of the housing. Friction balls are also provided on another wire that passes through the housing with the friction balls assuring a satisfactory reversal of the control member.

3,709,048
APPARATUS FOR MOUNTING ROLLERS IN OFFSET PRESSES

Karel Stepanek, and Josef Jurny, both of Hlavni, Czechoslovakia, assignors to Adamovske Strojirny, narodni Podnik, Adamov, Czechoslovakia

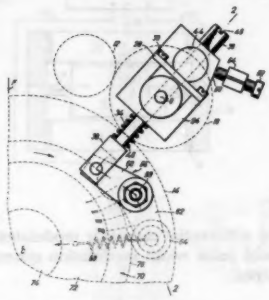
Filed Jan. 12, 1971, Ser. No. 105,852

Claims priority, application Czechoslovakia, Jan. 26, 1970, 547/70

Int. Cl. F16h *25/08*

U.S. Cl. 74—53 **5 Claims**

Apparatus for mounting an ink roller so that it may be shifted into engagement or disengagement with a form cylinder roller in an offset press. The apparatus comprises a holder for journalling the ink roller on a supporting frame, the holder being mounted so as to be reciprocally movable on said frame along a path radial to the axis of the form cylinder and an ink distributing roller to which it engages. The holder and frame are provided with engaging bearing means. A rod slideably extends through the holder parallel to the radial path of movement and has stop means limiting the relative upward



and downward movement of the rod through said holder. Means are provided for reciprocating the rod in response to the selected operation of the machine whereby said holder can be listed and swung to cause the ink roller to engage and disengage selectively with the form cylinder and the ink distributor.

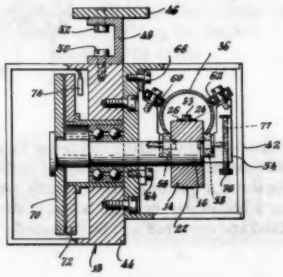
3,709,049
NON-SLIP LINEAR TO ROTARY MOTION CONVERSION APPARATUS

Ernst A. Gerauer, Norwalk, Conn., assignor to Metron Corporation, Providence, R.I.

Filed Sept. 8, 1970, Ser. No. 70,152

Int. Cl. F16h *27/02*

U.S. Cl. 74—89.2 **4 Claims**

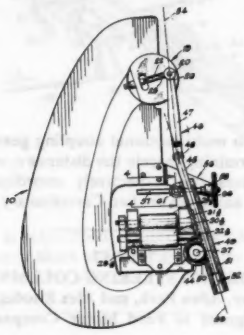


A non-slip linear to rotary motion conversion apparatus is provided for use with an angular measuring device. A cylinder having a very accurate constant diameter is mechanically coupled to an angular measuring device capable of accurately measuring the rotary motion of the windings or coils arranged in non-overlapping single turns around the surface of the cylinder and having free wire portions extending tangentially therefrom in opposite directions from the cylinder. The free wire portions are anchored at their free end to maintain the wire means in tension and the coils are offset to prevent overlapping of the coils on the cylinder. Means is provided for mechanically coupling at least one coil of the wire means to the cylinder whereby a non-slip highly reliable, linear to rotary motion conversion apparatus is provided that is mechanically absolute relative to the angular measuring device.

3,709,050
FINE ADJUSTMENT MECHANISM FOR STOCK FEEDING DEVICE

Richard J. Granger, Sutton Coldfield, England, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 20, 1970, Ser. No. 65,463
Claims priority, application Great Britain, Aug. 21, 1969, 41,762/69
Int. Cl. F16h 29/20
U.S. Cl. 74—121 4 Claims

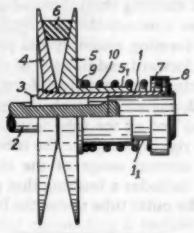


A device for effecting small adjustments in the stroke of a stock feeding mechanism while the latter is operating. The element which controls the stroke does not move during the stock feeding operation and therefore may readily be adjusted by the operator to vary the length of feed as required. The device is applicable to a reciprocable type of feeding mechanism in which the angular relation between an oscillating connecting rod and a rectilinearly movable member linked thereto may be adjusted so as to alter the excursions of the latter member and of the stock engaging elements connected thereto.

3,709,051
VARIABLE DIAMETER PULLEY

Jean Boissin, Parly, France, assignor to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, Colombes, France

Filed April 22, 1970, Ser. No. 30,796
Int. Cl. F16h 55/52
U.S. Cl. 74—230.17 M 10 Claims

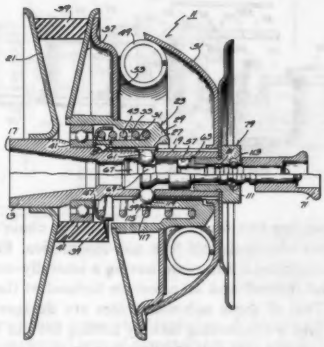


A variable diameter pulley for transmitting variable speed drive by a trapezoidal belt has a first cheek rigid with the pulley boss and a second cheek rotatable with and axially slidable along the boss, a first friction washer abutting against the side of the slidable cheek remote from the fixed cheek, and a second friction washer housing in a cup mounted rigidly on the end of the boss remote from the slidable cheek, and a helical spring arranged around the boss and abutting at one end against the first washer and at the other end against the second washer.

3,709,052
VARIABLE SPEED POWER TRANSMISSION WITH SNAP-IN CLUTCH

George G. Lassanske, Oconomowoc, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 10, 1971, Ser. No. 179,320
Int. Cl. F16h 55/52
U.S. Cl. 74—230.17 E 12 Claims

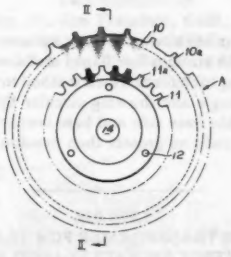


Disclosed herein is a variable speed V-belt power transmission including an arrangement for automatically and rapidly initially engaging an axially movable sheave member with a V-belt in response to the attainment by the sheave member of an increased rotary speed above a minimum rotary speed at which subsequent continuing V-belt driving engagement can be maintained. Also disclosed herein are means for adjusting the power transmission so that initial engagement of the movable sheave member with the V-belt will occur at varying rotary speeds depending upon the adjustment.

3,709,053
MULTI-SPEED TRANSMISSION FRONT GEAR MECHANISM FOR A BICYCLE

Masakazu Ohshita, c/o Shimano Industrial Co. Ltd. 77, 3-cho Oimatsu-cho, Sakai City, Japan

Filed Nov. 16, 1970, Ser. No. 89,594
Claims priority, application Japan, May 26, 1970, 45/52068
Int. Cl. F16h 55/30, 11/04
U.S. Cl. 74—243 R 3 Claims



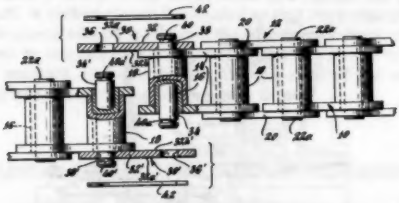
A multi-speed transmission front gear mechanism for a bicycle secured to a crank shaft and rotatable along therewith, wherein every second gear tooth of a high speed gear is previously cut so that the driving chain is engageable with the alternately cut gear teeth. This arrangement proves to be useful especially when the driving chain is to be shifted from a low speed gear into a high speed gear since the shifting operation can be effected and reliably how great the differential is in number of the gear teeth between the high speed and low speed gears.

3,709,054

CHAIN CONNECTING LINK

Joseph V. Montano, West Hartford, Conn., assignor to Litton Industrial Systems, Inc.

Filed Oct. 20, 1970, Ser. No. 82,249
Int. Cl. F16g 13/02
U.S. Cl. 74—258 10 Claims



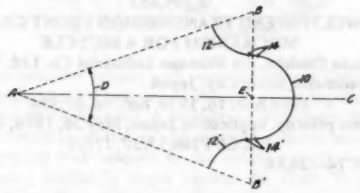
A connecting link for power transmission chain is disclosed having two identical half link sub-assemblies. Each sub-assembly comprises a link plate having a laterally-extending pin at one end thereof and an aperture formed at the other end thereof. Two of these sub-assemblies are designed to be assembled into a connecting link by having the pin on one sub-assembly extend through the aperture in the link plate of the other sub-assembly. The sub-assemblies are held in assembled position by two spring clips which are attached to both pins at either side of the connecting link.

3,709,055

GEAR TOOTH PROFILE

Leslie H. Grove, 707 East Hoyt Ave., Saint Paul, Minn.

Filed Jan. 4, 1971, Ser. No. 103,617
Int. Cl. F16h 55/06; F01c 1/18
U.S. Cl. 74—462 6 Claims



Gear tooth profiles having circular tip arcs and circular dedendum arcs with straight line flanks and a method for designing gears having such teeth which method involves laying out an isosceles triangle and drawing circular tip and dedendum arcs relative to the base side and base corners of the triangle, the arcs having radii no greater than one-fourth the length of the base.

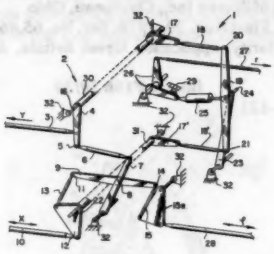
3,709,056

COORDINATE TRANSFORMER FOR TRANSFORMING CONTROL SIGNALS IN AIRPLANES

Siegfried Stauber, Weingarten, and Klaus Suttner, Stetten, both of Germany, assignors to Dornier A. G., Friedrickafen/Bodensee, Germany

Filed Jan. 18, 1971, Ser. No. 107,100
Claims priority, application Germany, Feb. 27, 1970, P 20 09 145.6
Int. Cl. G05g 1/04
U.S. Cl. 74—469 2 Claims

The disclosure is of a coordinate transformer for transforming control signals for airplanes, particularly for transforming Cartesian input signals into polar output signals, which have, in addition to a thrust control element, a thrust direction control element or operating member for controlling the thrust components and for uncoupling control axles. This is achieved



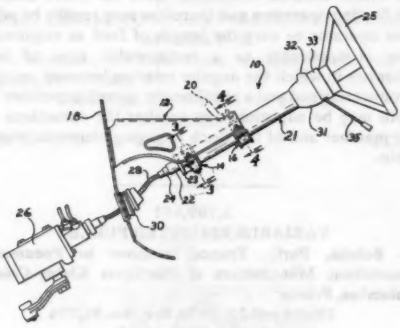
by the use of two multi-sectional coupling gears or linkages, one linkage determining therein the distance r, while the other linkage determines the respectively coordinated angle α toward the polar axis from the two Cartesian x-y input signals.

3,709,057

ENERGY ABSORBING STEERING COLUMN ASSEMBLY

Ernest W. Kitzner, Allen Park, and Alex Rhodes, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 5, 1971, Ser. No. 169,395
Int. Cl. B62d 1/18
U.S. Cl. 74—492 11 Claims



An energy absorbing steering column having an outer tube secured to vehicle support structure. The tube rotatably supports a telescopic steering shaft. Spaced apart deforming and guiding assemblies connect the column tube to the support structure. The deforming assembly has projections which engage an enlarged forward end portion of the tube. The projections are constructed to plastically deform the tube upon axial displacement and, thereby, absorb the energy of an impact load. The forward end of the tube is enlarged to provide increased torsional rigidity between the tube and the deforming assembly during normal usage of the steering system. The guiding assembly includes a bushing that permits axial sliding displacement of the outer tube under the impact load.

3,709,058

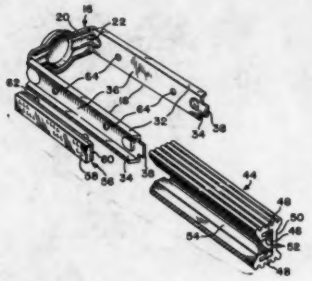
CYCLE PEDAL WITH ANCHORED REFLECTOR

Carlton P. Pawsat, Maysville, Ky., assignor to Wald Manufacturing Company, Inc., Maysville, Ky.

Filed April 29, 1971, Ser. No. 138,574
Int. Cl. B62m 3/12
U.S. Cl. 74—594.4 16 Claims

The pedal comprises a rigid frame having a pair of spaced parallel legs, each of which includes upper and lower outturned protective flanges flanking a web portion of the leg; the

web portion carries a permanently anchored reflector element protected by the out-turned flanges. Over each leg and reflector element is telescoped an internally channeled extruded tread member or block to be engaged by the foot of a cyclist.



3,709,059

TRANSMISSION FOR THE FEEDING MOVEMENT OF MECHANICAL CARRIAGE UNITS OF MACHINE TOOLS

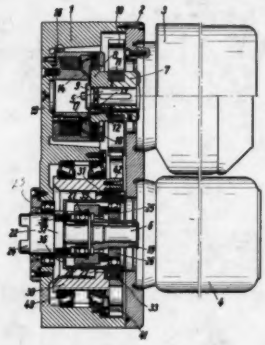
Karl Heinz Elsel, Aldingen, Germany, assignor to Karl Huller Gesellschaft mit beschrankter Haftung, Ludwigsburg, Germany

Filed Sept. 14, 1970, Ser. No. 72,012

Claims priority, application Germany, Sept. 13, 1969, G 69 36 058.3

Int. Cl. F16h *35/00, 37/06;* **F16d** *67/06*

U.S. Cl. 74—661 **18 Claims**



A transmission for connecting a variable speed feed shaft and a constant speed fast traverse shaft to an output shaft which, in turn,can be connected to a machine tool carriage. The transmission includes an internal gear driven via a friction clutch by the fast traverse shaft and adapted to be held by a friction brake. A sleeve-like flexible internal gear having a different number of teeth than said internal gear and smaller than said internal gear is connected to the output shaft and is disposed inside the internal gear. A cam rotor driven by the feed shaft is disposed inside the flexible gear and forces at least one circumferential portion thereof into meshing engagement with said internal gear.

3,709,060

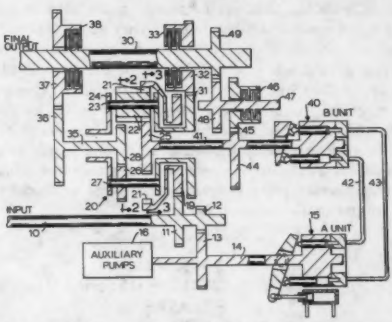
NARROW RANGE HYDROMECHANICAL TRANSMISSION

Elias Orshansky, Jr., San Francisco, Calif., assignor to Urs Systems Corporation, San Mateo, Calif.

Filed Feb. 16, 1971, Ser. No. 115,259

Int. Cl. F16h *47/04*

U.S. Cl. 74—687 **13 Claims**



A narrow range power transmission. A planetary gear train has first and second sets of planet gears with a common carrier and intermeshed with each other. An input gear driven by driving means is meshed with the planet gears of the first set. One of two output gears is supported by the carrier, while the other is in mesh with the planet gears of the second set. A reaction gear is in mesh with the first set of planet gears and is connected to the driving means through a pair of hydraulic units, one serving as a pump while the other serves as a motor, and vice versa, for regulating the torque applied to the planet gears. During the time each output gear is engaged, one hydraulic unit serves as a motor at the lowest output speed within the speed range of that output gear and decreases its stroke as the output speed increases until its stroke reaches zero, and then its stroke increases in the opposite direction, as that hydraulic unit automatically becomes a pump. Meanwhile, the other hydraulic unit, serving as a pump at the lowest output speed within the speed range of that output, decreases its speed, and at zero speed becomes a motor with its speed thereafter increasing in the opposite direction as the output speed increases further.

3,709,061

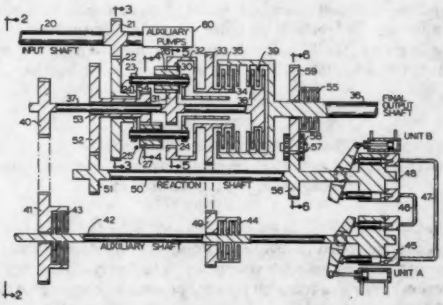
NON-REGENERATIVE HYDROMECHANICAL TRANSMISSION

Elias Orshansky, Jr., San Francisco, Calif., assignor to URS Systems Corporation, San Mateo, Calif.

Filed Feb. 16, 1971, Ser. No. 115,596

Int. Cl. F16h *47/04*

U.S. Cl. 74—687 **20 Claims**



An input means and an output means are connected together by a plurality of gear trains which are intermediately

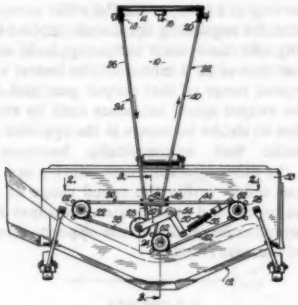
connected to each other by a first planet gear set of a planetary gear arrangement. The planetary gear arrangement also has a second planetary gear set intermeshed with the first set. The gear trains are of overlapping speed ratios and are successively connected to drive the output means through a pre-selected speed range, with means being provided for disconnecting each driving train from the output means after the following train has been connected to it. In a preferred form, the planetary gear set has a pair of alternately used output gears, both meshing with the first set of planet gears, one output gear being a sun gear, the other being a ring gear. A novel system employs each output gear, at times, in a reaction system incorporating a reaction gear meshed with the second planetary gear set. A first hydraulic unit is in driving engagement with that reaction gear and a second hydraulic unit is hydraulically connected to the first hydraulic unit, with one of the hydraulic units serving as a pump while the other one serves as a motor and vice versa. Means are provided for alternately connecting and disconnecting the output gears to the second hydraulic unit, for use in the reaction system.

3,709,062

BELT DRIVE FOR PLURALITY OF SINGLE GROOVE SHEAVES

George E. Draege, Oregon, Ill., assignor to Hesston Corp., Hesston, Kans.

Filed Oct. 1, 1971, Ser. No. 185,747
Int. Cl. F16h *37/00*
U.S. Cl. 74—722 **8 Claims**



A power transmission in which a plurality of single groove sheaves are driven unidirectionally by a single, continuous belt having but one arc of contact with each sheave respectively. Each of the driven sheaves and an adjacent idler pulley are essentially coplanar thereby presenting a compact transmission requiring minimal operating space. The configuration of the belt is such that there is no more than one-quarter turn in any one stretch of the belt. Structure is provided to preclude contact of those stretches of the belt which cross one another.

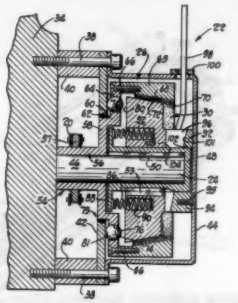
3,709,063

CHANGE SPEED TRANSMISSION

Walter H. Moorhead, 4939 Donald Avenue, Cleveland, Ohio

Filed Feb. 16, 1971, Ser. No. 115,686
Int. Cl. F16h *15/56*
U.S. Cl. 74—750 **4 Claims**

A change speed transmission comprises rotatable input and output drive assemblies which are selectively connected by friction gearing to transmit power between an engine shaft and a driven device at different speed ratios. A body of one of the assemblies defines one direct drive friction gear member and part of an epicyclic friction gear unit. The other assembly carries a shifting member which is movable between one position for engagement with the direct drive friction gear member and



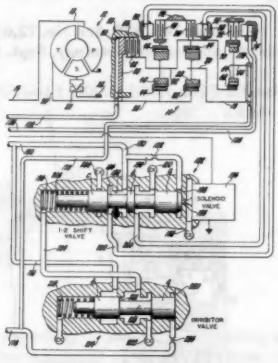
a second position for engaging the epicyclic gear unit to provide a speed change between the drive assemblies.

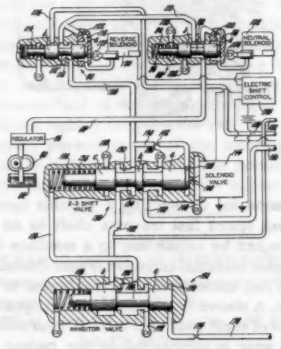
3,709,064

MULTI-RATIO TRANSMISSION AND CONTROL WITH DOWNSHIFT INHIBITORS

Robert H. Schaefer, Westfield, and Richard H. Williams, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 10, 1971, Ser. No. 114,268
Int. Cl. F16h *5/42*
U.S. Cl. 74—752 A **2 Claims**





A transmission and control having a plurality of forward drive ratios and solenoid controlled shift valves for controlling ratio interchange. Inhibitor valves are included to prevent

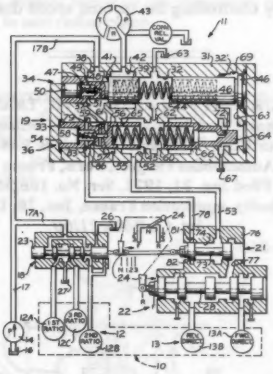
downshifting of the shift valves when the transmission speed is above a predetermined value.

3,709,065

COMPACT FLUID SYSTEM FOR SHIFTING A TRANSMISSION

James G. Starling, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed March 8, 1971, Ser. No. 121,810
Int. Cl. F16h *3/44*
U.S. Cl. 74—753 **6 Claims**



Means for applying fluid pressure to selected pairs of the drive conditioning devices of a vehicle transmission in response to control lever movement includes a pressure modulating valve for establishing a gradual pressure rise at the selected drive devices and a safety differential spool valve provides for a delayed lesser pressure rise at the one of the devices which re-establishes drive through the transmission. The safety differential spool valve performs the further function of blocking fluid pressure from one of the selected devices if the vehicle engine should be started up with the control levers at a position other than neutral. Two valves thus provide transmission control functions which have heretofore required more complex valving assemblies.

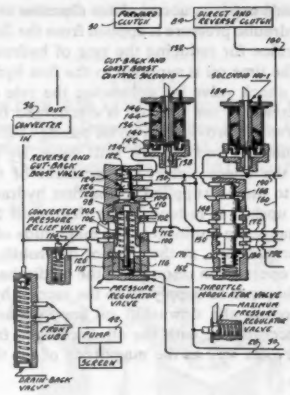
3,709,066

AUTOMATIC TRANSMISSION CONTROL CIRCUIT WITH ELECTRICALLY OPERATED VALVES

Lawrence D. Burcz, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 21, 1970, Ser. No. 39,492
Int. Cl. B60k *21/00*
U.S. Cl. 74—866 **8 Claims**

A control system for a multiple-ratio power transmission mechanism comprising fluid pressure operated clutch and brake servos adapted to control the relative motion of torque delivery gear elements, a valve circuit including electrically actuated pilot valve operators for controlling pressure distribution to the servos, a pressure regulator valve system communicating with the valve circuit for any given operating condition, said regulator valve system comprising a cutback pressure valve and a coasting boost valve that are effective to modify the regulating characteristics of the regulator valve



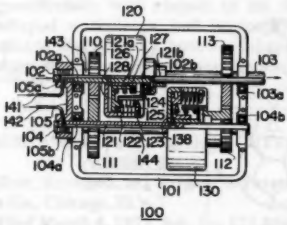
when the driven speed and engine vacuum under any given operating condition are within predetermined operating zones.

3,709,067

HYDRAULIC CONTROL SYSTEM FOR TRANSMISSIONS

Shin Ito, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Filed Feb. 10, 1971, Ser. No. 114,179
Claims priority, application Japan, Feb. 12, 1970, 45/11479
Int. Cl. B60k *21/00*; F16h *3/22, 3/08*
U.S. Cl. 74—869 **9 Claims**



The hydraulic control system is applied to transmissions in which the high speed range is obtained by supplying oil to a first one of at least two hydraulic servos and discharging oil from a second hydraulic servo. The low speed range is obtained by discharging oil from the first hydraulic servo and supplying oil to the second hydraulic servo. This hydraulic control system comprises a hydraulic pressure source, a pressure regulator valve, a governor valve, a throttle valve and first and second shift valves. The hydraulic control pressure supplied from the hydraulic pressure source and regulated by the pressure regulator valve is directed through the first shift valve to the first hydraulic servo and is also directed through the second shift valve to the second hydraulic servo. The governor pressure developed by the governor valve, which conforms to the vehicle velocity, and the throttle pressure developed by the throttle valve, which conforms to the engine output, are applied to the first shift valve. The throttle pressure, moreover, actuates the second shift valve. In addition, the hydraulic pressure of the first hydraulic servo is applied to the second shift valve to oppose the throttle pressure. Thus, the oil discharge starting time of the second hydraulic servo at the time of upshift is delayed in accordance with the hydraulic

pressure that is supplied to the first hydraulic servo. The degree of the time delay also is changed in accordance with the magnitude of the throttle pressure. The second shift valve forms a variable capacity accumulator chamber at the point at which the hydraulic pressure is applied from the first hydraulic servo. An orifice for reducing the rate of hydraulic pressure increase at the time oil is supplied to the first hydraulic servo as well as a check valve for enhancing the rate of hydraulic pressure decrease at the time oil is discharged from the first hydraulic servo are provided in an oil passage between the accumulator chamber and the first shift valve. By virtue of the orifice and the check valve, the gradient of the pressure change due to the oil supplied to the first hydraulic servo at the time of upshift is reduced. The degree of this gradient reduction changes to conform to the magnitude of the throttle pressure. Furthermore, at the time of downshift, the second shift valve is operated in response to the oil discharge from the first hydraulic servo so supply oil to the second hydraulic servo, and therefore the downshift oil supply starting time is reduced in accordance with the oil discharged from the first hydraulic servo as well as the magnitude of the throttle pressure.

3,709,068

POWER TRANSMISSION

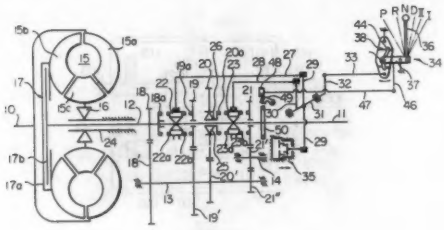
Yohichi Mohri, 402 Baba-cho, Tsurumi-ku, Yokohama, Japan

Filed Dec. 28, 1970, Ser. No. 101,996

Claims priority, application Japan, Dec. 29, 1969, 44/857; Feb. 6, 1970, 45/10279

Int. Cl. B60k 21/00

U.S. Cl. 74—866 **5 Claims**



A multiple speed power transmission for a motor vehicle in which a free wheeling device is provided for effecting a shift from low to high speed drive ratio without disconnecting clutch means from a lower speed The the power transmission includes control means which comprises a manually operated shifting device and a fluid pressure operated servo motor. The fluid pressure operated servo motor is associated with the manually operated shifting device thereby to effect the shift between a plurality of gear ratios either automatically or manually.

3,709,069

DRIVE SYSTEM FOR POWERED VEHICLES

Hans Hagen, Heinrich-Buz Weg 10, Munich, Germany

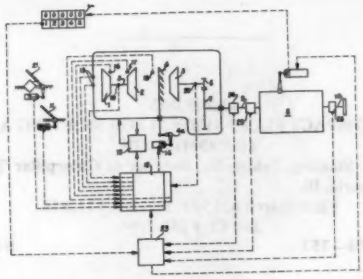
Filed Dec. 22, 1970, Ser. No. 100,580

Claims priority, application Germany, Dec. 24, 1969, P 19 64 977.5

Int. Cl. B60k 21/00

U.S. Cl. 74—865 **3 Claims**

In a turbine driven vehicle the usual clutch between the turbine and the gear shift transmission is replaced by means for automatically controlling the turbine speed during gear shifting.



3,709,070

GOVERNOR UNIT FOR AUTOMATIC TRANSMISSION

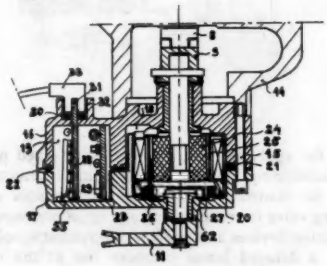
Claude Lombard, and Jean Piret, both of Billancourt, France, assignors to Regie Nationale des Usines Renault, Hauts de Seine and Automobiles Peugeot, Paris, France

Filed Jan. 21, 1971, Ser. No. 108,386

Claims priority, application France, Jan. 26, 1970, 7002585

Int. Cl. B60k 21/00

U.S. Cl. 74—866 **11 Claims**



This governor designed for controlling automatic change-speed transmissions of automotive vehicles is characterized by the disposal of all electrical and electronic devices and elements in a common casing comprising at least two hollow bodies forming a plurality of fluid-tight chambers, one body being insulated and disposed on the transmission side and the other conducting and disposed on the opposite side of said transmission, the resulting grouping of the various functions providing obvious technical and economical advantages.

3,709,071

CABLE-TIGHTENING DEVICE

Charles Moransais, La Boisse, France, assignor to Zafira France, La Boisse, France

Filed June 1, 1970, Ser. No. 41,805

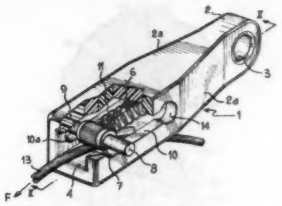
Claims priority, application France, June 2, 1969, 6917990; Oct. 28, 1969, 6936951

Int. Cl. F16g 11/10

U.S. Cl. 81—3 J **5 Claims**

A cable-tightening device of the kind in which the cable is wedged between two parts which are clamped against each other when a tractive pull is applied in one direction on the cable, while the latter is free to slide through the device when the direction of the pull is reversed, comprising a tubular casing having a wall traversed by an oblique channel located in a radial plane and intended for the passage of the cable, and a

cylindrical rotatable plug with longitudinal nipples mounted inside the tubular casing and elastically urged towards the cable-channel outlet, the longitudinal chamber formed inside



the casing having a quadrilateral section and the diameter of the plug being slightly less than the dimension of the quadrilateral section in said radial plane.

3,709,072

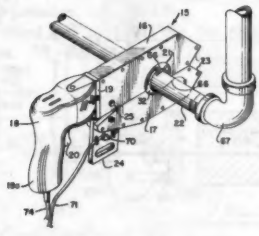
MOTOR DRIVEN PIPE WRENCH

William L. Rogers, Box 313, Moriarty, N. Mex.

Filed April 15, 1971, Ser. No. 134,213

Int. Cl. B25b *17/00, 21/00*

U.S. Cl. 81—57.13 **18 Claims**



A pair of pivotally connected jaws accommodate a rotatable ring gear of two parts which are locked together when the jaws are closed, but are separated and disposed in the respective jaws when the jaws are opened for application or removal of the wrench to or from a pipe. The ring gear carries adjustable grippers for engaging the pipe, and a motor drive for the ring gear may be a portable electric drill mounted on one of the jaws.

3,709,073

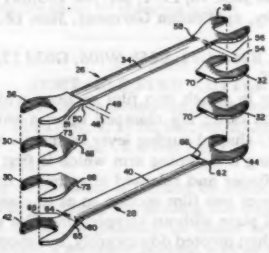
LAMINATED WRENCH

Robert L. Kurtz, 15 Apple Tree Lane, Windsor, Conn.

Filed Jan. 25, 1971, Ser. No. 109,195

Int. Cl. B25b *13/02*

U.S. Cl. 81—119 **10 Claims**



A lightweight wrench formed from a plurality of laminations welded together in assembly and having a body including a hollow elongated handle and heads at opposite ends of the handle. The hollow handle and a portion of each head are formed by two outer laminations. Each head is further defined by two additional inner laminations. The outer laminations are bent to impart strength to the handle and head portions of the wrench.

3,709,074

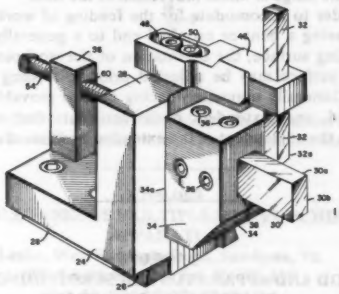
TOOL HOLDER FOR AUTOMATIC SCREW MACHINE

Gerard H. Santerre, 9 Dorset Road, New Britain, Conn.

Continuation-in-part of Ser. No. 845,416, July 28, 1969, abandoned. This application Jan. 15, 1971, Ser. No. 106,700

Int. Cl. B23b *29/26*

U.S. Cl. 82—36 R **12 Claims**



A tool holder for an automatic screw machine includes and L-shaped base portion with one leg secured to the machine's axially reciprocable tool support fixture, and includes an upstanding leg or web which carries an elongated cutting tool oriented parallel to the axis of the machine. A second tool is also provided on the upstanding web, and in one version is oriented perpendicularly with respect to the first tool for cutting cup-shaped workpieces, and in another version is oriented parallel to said first tool, both versions being particularly suited to machining cup-shaped workpieces.

3,709,075

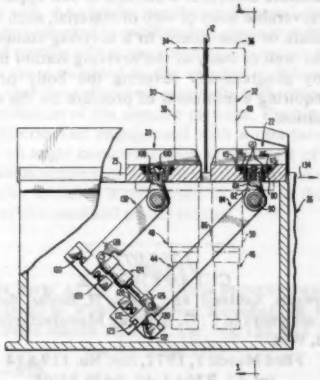
METHOD AND APPARATUS FOR CUTTING A WORKPIECE

Willy J. Goellner, Rockford, Ill., assignor to Paramount Textile Machinery Co., Chicago, Ill.

Filed March 4, 1971, Ser. No. 121,066

Int. Cl. B26d *7/06, 7/02*

U.S. Cl. 83—27 **21 Claims**



A method and apparatus for severing a workpiece with a cutting tool returnable through the kerf or cut made thereby

and wherein at least one translatable slide is employed to move the uncut major portion of the workpiece in a generally linearly direction away from the kerf prior to return of the cutting tool. For enhancing measuring accuracy and life, provision is made for applying a slide moving force so as to minimize the moment exerted on the slide about the ways on which the slide is slidably moved during the translation. With the slide clamped to upper and lower slide surfaces of generally parallel ways, such minimization may be accomplished through the application of the slide moving force generally centrally of those way slide surfaces. For this purpose, a lever having a generally arcuate force transmitting surface may be employed to engage with a driven surface of the slide at a contact zone which remains substantially constant within the range of linear movement of the slide.

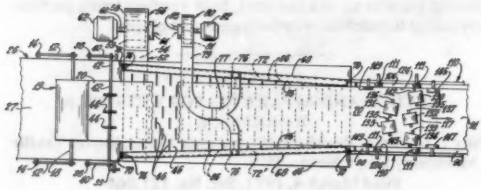
In order to accomodate for the feeding of workpiece portions having a bent or crooked end to a generally L-shaped supporting surface, the orientation of the workpiece relative to that surface may be adjusted prior to feeding the workpiece. Generally oppositely facing clamps movable between retracted and extended positions alter that orientation through the adjustment of the extended position of one clamp.

3,709,076

METHOD AND APPARATUS FOR SUBDIVIDING A BODY OF FIBERS INTO SECTIONS

Ronald E. Kissell, Newark, and Ulysses T. Gambill, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation

Filed Oct. 26, 1970, Ser. No. 84,038
Int. Cl. B26d *1/56*
U.S. Cl. 83—42 **37 Claims**



The disclosure embraces a method of and apparatus for advancing a severable body or web of material, such as a body of mineral fibers or glass fibers, to a severing station, and subdividing the web or body at the severing station into discrete sections by progressively severing the body or web in a manner requiring a minimum of pressure on the severing instrumentalities.

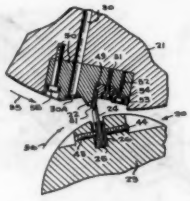
3,709,077

CUT-OFF DEVICE

John F. Trogan, Ashland, and James H. Beebe, Bayfield, both of Wis., assignors to C. G. Bretting Manufacturing Co., Inc., Ashland, Wis.

Filed March 1, 1971, Ser. No. 119,614
Int. Cl. B26d *1/40;* **B65h** *35/08*
U.S. Cl. 83—152 **9 Claims**

A rotary shear or cut-off device for web fed materials such as paper napkin stock that includes a novel adjusting means, the device being capable of operating at high speeds without difficulties, and wherein all four edges of the knife, such as the



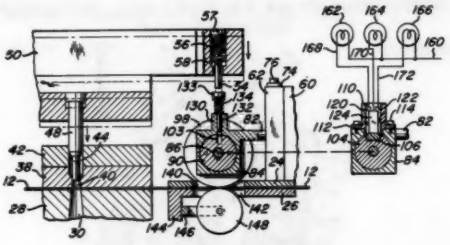
anvil knife, can be used, and wherein chamfered edges are utilized on the anvil knife and fly knife.

3,709,078

STRIP MEASURING APPARATUS

William D. Mills, 460 West Michaels Rd., Tipp City, Ohio

Filed April 24, 1970, Ser. No. 31,487
Int. Cl. B26d *5/20*
U.S. Cl. 83—226 **12 Claims**



Apparatus for precisely measuring the length of feed of continuous strip material as the strip material progressively and intermittently moves into a press or the like for operation thereupon. Rotor mechanism engages the strip material or engages a strip feed roll and rotates with movement thereof. The rotative position of the rotor mechanism is automatically noted at the termination of a feed operation of the strip material. The apparatus thus is capable of indicating and/or correcting and/or controlling the length of travel or length of feed of the strip material.

3,709,079

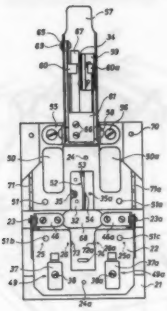
FILM SPLICER

Carl H. Wurker, I7239 Aistaig/Blackforest, Germany

Filed June 16, 1971, Ser. No. 153,621
Claims priority, application Germany, June 18, 1970, P 20 30 015.6
Int. Cl. B26d *5/42;* **B65h** *69/06;* **G03d** *15/04*
U.S. Cl. 83—375 **18 Claims**

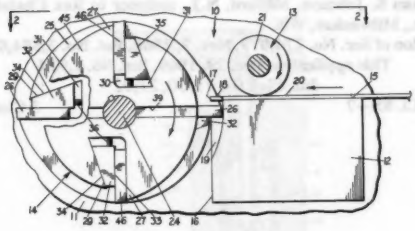
A film splicer in which two film sections with their ends overlapping each other are clamped upon a swivel plate at both sides of a U-shaped cutting lever by means of two clamp slides each having a clamping arm which is first pivoted upwardly by one finger and released after being shifted in this lifted position over one film section so as to clamp the latter upon the swivel plate without scraping the film surface. The cutting lever is then pivoted downwardly, but shortly before its cutting blade engages with the film, a resilient depressor lever which is located between the lateral arms of the cutting lever presses tightly upon the overlapping film ends closely adjacent to both lateral sides of the blade. After the cut-off ends of the

two film sections are removed, a part of an adhesive tape is applied upon one side of the abutting end portions of the film sections, whereupon the swivel plate with the film sections



clamped thereon is pivoted over and the other part of the tape is folded 180° to the other, now upper side of the film end portions and is pressed thereon.

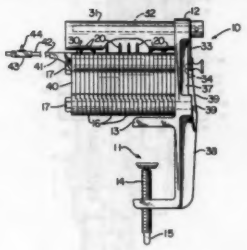
3,709,080
SHEET REDUCTION APPARATUS
Jesse L. Lindquist, Albany, Oreg., assignor to Oregon Metallurgical Corporation, Albany, Oreg.
Filed July 24, 1970, Ser. No. 58,051
Int. Cl. B23d *25/00*
U.S. Cl. 83—355 **1 Claim**



Apparatus for subdividing sheets of material, such as thin sheets of titanium, into small coupons or pellets. Feed rollers are provided for selectively advancing the sheet material over the surface of an anvil having a front edge that extends in notched outline defining spaced-apart teeth. A unique arrangement of flying tools are radially mounted on discs stacked upon a rotatable arbor in front of the anvil, with the tools being adapted to intermesh with the anvil teeth and cut coupons from the sheet. The top of the anvil is located above the axis of rotation of the arbor so that the coupons are removed from the sheet by shearing action.

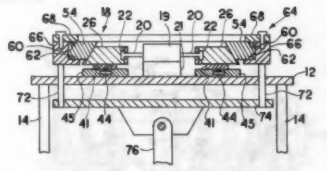
3,709,081
PORTABLE STRIP CUTTER
Jerome Rush, 4965 South Broadway, Englewood, Colo.
Filed Nov. 9, 1970, Ser. No. 87,800
Int. Cl. B26d *7/16*
U.S. Cl. 83—411 **11 Claims**

A portable strip cutter is formed by support structure including an upright guide for guiding the edge of a material through the cutter, a plurality of blade holding members which also define a common bearing surface for the material to be drawn through cutter blades mounted in selected ones of the blade holding members, and a guide bar is rotatably mounted above the bearing surface to define a restricted passage through which the material is fed to the cutter. An extension is mounted on the guide with a sleeve-mounted,



pointed projection slidably movable on the extension to hold a piece of material for cutting into a spiral or circular strip.

3,709,082
SIMULTANEOUS MULTIPLE SIDE PUNCHING APPARATUS
Joseph P. Leska, West Sandgate Road, Sandgate, Vt.
Filed Aug. 6, 1970, Ser. No. 61,650
Int. Cl. B26d *5/08*; **B26f** *1/14*
U.S. Cl. 83—618 **25 Claims**

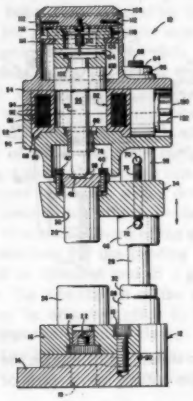


In this apparatus a plurality of angularly spaced punch assemblies are disposed about a tubular blank-holding means, each punch assembly including: a ram, a ram guide and at least one punch means interconnected with the radially inner end of each ram. An annular member is disposed about all the assemblies and adapted to oscillate in a plane at right angles to the plane of motion of the rams and punch means. Individual cam means are connected to the annular member and each cam has a cam-face disposed angularly with respect to the plane of oscillation of the annular member. Each cam-face is in sliding, interlocked engagement with a ram-face which is disposed at an angle complementary to the angle of said cam-faces. By this arrangement, force from the plane of oscillation of the annular member is converted to force in the plane of movement of the rams and punch means.

3,709,083
ELECTRICALLY ACTUATED PUNCH PRESS
Norman R. Doherty, 870 Main Street, Farmingdale, N.Y.
Filed March 18, 1971, Ser. No. 125,484
Int. Cl. B26d *5/08*
U.S. Cl. 83—575 **12 Claims**

A solenoid having an axially movable armature is coupled to and arranged to displace the movable member of a punch press. A plurality of different tools may be clamped to an anvil

and tool holder of the punch press for either assembly line or work bench type of production. The apparatus is small and



relatively light in weight. The solenoid may have resin encapsulated, coiled aluminum foil strips instead of the more conventional wire wound coil.

3,709,084

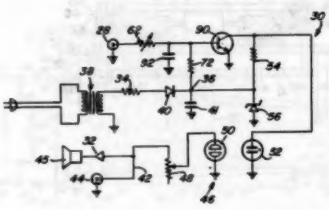
TRANSDUCER VOLUME CONTROL FOR STRINGED MUSICAL INSTRUMENTS

Graham E. Stobaugh, Route 3, Box 436, Rocky Mount, N.C.

Filed Aug. 16, 1971, Ser. No. 171,910

Int. Cl. G10h *3/00*

U.S. Cl. 84—1.15 **8 Claims**



The amplified output of a stringed musical instrument is momentarily reduced by a variable amount during intervals of engagement. Magnetic sensing means detecting such engagement provides a trigger pulse of short duration which is operative through a volume reducing control circuit to vary the output of an amplifier through which sound is fully amplified only during periods when the strings undergo free vibration.

3,709,085

TEACHING DEVICE FOR ATTACHMENT TO A KEYBOARD INSTRUMENT

Juan M. Del Castillo, Risco No. 119, Mexico, Mexico

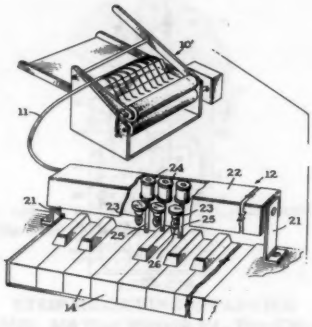
Filed April 20, 1971, Ser. No. 135,601

Claims priority, application Mexico, Aug. 3, 1970, 121258; June 26, 1970, 120372; June 26, 1970, 120373; June 26, 1970, 120374; July 10, 1970, 120687

Int. Cl. G10f *5/04*

U.S. Cl. 84—166 **17 Claims**

A device non-integral with the keyboard instrument with which it is used is activated through sheet, card or substitute keyboard means to activate in turn indicating heads mounted over the keyboard of an organ, piano or similar instrument and which designate the keys to be played by lighting or solenoid controlled means. The control sheet or card may utilize raised, indented, or apertured sheets or cards detected



through various type contact or photocell means which feed the signal through an electronic relay to the indicating means.

3,709,086

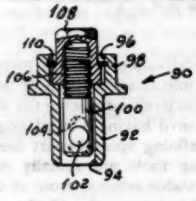
HIGH STRENGTH ADJUSTABLE QUARTER TURN FASTENER

Norman S. Johnson, Milford, N.J., assignor to Rex Chainbelt Inc., Milwaukee, Wis.

Division of Ser. No. 774,079, Nov. 7, 1968, Pat. No. 3,554,075. This application Dec. 29, 1969, Ser. No. 1,934

Int. Cl. F16b *19/00, 21/02*

U.S. Cl. 85—7 **3 Claims**



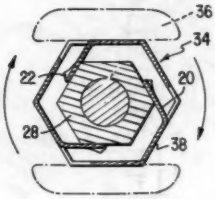
A quarter turn fastener assembly for joining two members in assembled relationship in which one of the members rotatably supports a hollow shaft having a head on one side thereof and having diametrically oppositely located, axially extended wall slots which receive a cross pin at the other side of the member for sliding movement in the direction of the axis of the shaft. Adjustable means limits movement of the cross pin in a direction away from the head to adjust the force with which the two members are drawn together when the fastener is operated. The side of the other member remote from the first member carries a receptacle having a central opening and diametrically oppositely extending slots and having generally circularly arranged cam tracks leading to level portions onto which the cross pin rides behind resilient locking detents in response to rotation of the shaft.

3,709,087

TORQUE LIMITING THREADED FASTENER

Wayne B. Stone, Jr., 7307 Nevis Road, Bethesda, Md.

Filed Sept. 10, 1970, Ser. No. 70,994
Int. Cl. F16b *31/02*
U.S. Cl. 85—61 7 Claims



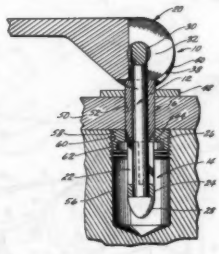
A torque limiting threaded fastener defined by a conventional nut or bolthead and a surrounding, geometrically similar driver resiliently interconnected with the normal torque applying faces of the conventional nut or bolthead.

3,709,088

QUICK ACTING, HIGH TENSILE, BLIND FASTENER

Kenneth H. Pitzer, Los Angeles, Calif., assignor to Adjustable Bushing Corporation, Hollywood, Calif.

Continuation-in-part of Ser. No. 808,779, March 20, 1969, abandoned. This application Dec. 14, 1970, Ser. No. 98,054
Int. Cl. F16b *13/06*
U.S. Cl. 85—74 4 Claims



Rotation of a cam brings a first cam surface to bear on the driving side of a sheet and forces the head of a drawbolt to expand the fingers of an expansible sleeve radially outward for subsequent engagement of the blind side of another sheet. Continued rotation of the cam brings a second cam surface into engagement with the driving side of the sheet to draw the expanded sleeve against the blind side, clamp the sheets together, and form a joint.

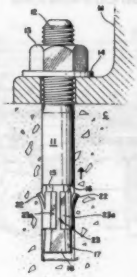
3,709,089

CAPTIVE FASTENING ELEMENT

Roy Seetaram, 123 Thistledown Boulevard, Ontario, Canada

Filed Dec. 9, 1970, Ser. No. 96,381
Claims priority, application Canada, Oct. 5, 1970, 094976
Int. Cl. F16b *13/06*
U.S. Cl. 85—77 10 Claims

This specification discloses a captive fastening element of the type which is designed to fit into a hole drilled in concrete of the same size as the element itself, and having a blind end having a reduced diameter neck and tapering outwardly again from that neck, and being provided with a single one piece wedging collar around the reduced neck having a single split down one side thereof permitting the internal diameter of the collar to be expanded by the wedging action of the tapered end. Preferably the one piece collar incorporates one or more



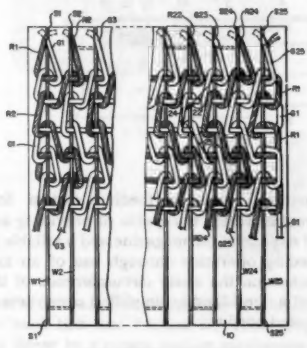
struck out tongues adapted to engage the insides of the walls of the hole drilled in the concrete bed and hold the same in position.

3,709,090

METHOD OF PRODUCING A FABRIC AND FABRIC

Selma Gruenberg, 63 Concord St., Clifton, N.J.

Filed June 23, 1971, Ser. No. 155,759
Int. Cl. D04c *1/12*
U.S. Cl. 87—4 6 Claims



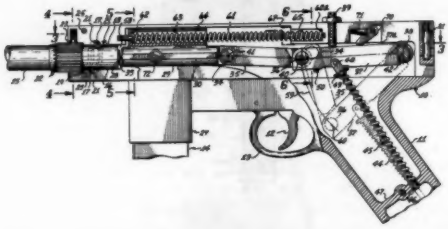
A manual process is described for producing a fabric wherein a plurality of parallel warp threads are arrayed on a cardboard thread frame. Multicolored surface yarns are associated with respective ones of said warp threads. The fabric is produced by pulling one of the end surface yarns across the warp threads and successively knotting each of the remaining surface yarns with the end yarn where the end yarn intercepts the warp threads. The knots are formed by bringing the surface yarn over the end yarn, underneath the end yarn and warp thread, and back over the end yarn toward where the next row will be formed. After each row is formed, either of the end surface yarns may be used as the common yarn for the next row. The pattern of the fabric is determined by this selection of end surface yarns.

3,709,091

ADJUSTABLE HESITATION BLOW BACK OPERATED GUN TOGGLE MECHANISM

Walter E. Perrine, 4228 W. Osborn, Phoenix, Ariz.

Filed July 8, 1970, Ser. No. 53,078
Int. Cl. F41d 3/02
U.S. Cl. 89—189 6 Claims



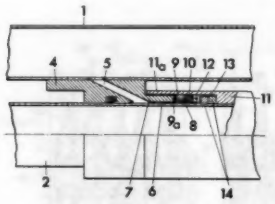
A toggle action pistol in which an under-center toggle providing a given hesitation is tripped to recede into its handle by the effects of gas pressure generated at the time of firing.

3,709,092

GAS-OPERATED CARTRIDGE FEEDING SYSTEM FOR TUBULAR MAGAZINE FIREARMS

Masaru Tazome, Tomobemachi, Japan, assignor to SKB Arms Company

Filed Sept. 8, 1971, Ser. No. 178,597
Claims priority, application Japan, Jan. 22, 1971, 46/1912
Int. Cl. F41c 5/02
U.S. Cl. 89—191 2 Claims



A gas-operated cartridge feeding system for tubular magazine firearms which is capable of providing an effective utilization of a space in the magazine and a reliable manner of cartridge feeding operation through use of an annular gas chamber formed on the outer circumference of the tubular magazine and a considerably simplified construction realized in a gas-operated portion.

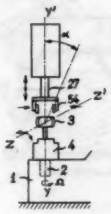
3,709,093

METHOD OF CUTTING GEAR TEETH OF HOMOKINETIC JOINTS OF HYDRAULIC PUMPS AND MOTORS

Francois C. Pruvot, and Henri Poletti, both of 8/10 Avenue Emile Zola, Billancourt Hauts de Seine, France

Filed Nov. 9, 1970, Ser. No. 87,745
Claims priority, application France, Nov. 21, 1969, 6940149
Int. Cl. B23f 9/04
U.S. Cl. 90—8 4 Claims

Method of cutting gear teeth having a convex working surface of a homokinetic joint, consisting in imparting to a multicutter tool a rectilinear reciprocating motion combined with a movement of rotation while the workpiece to be cut, mounted in a mandrel, rotates about its axis at a speed determined as a function of the movement of rotation of said tool, characterized in that the angle formed between the axes of rotation of the workpiece and of the tool is modified as well as the distance between the cutters and the workpiece, according to a law linking the momentary values of said angle and distance so that at any time the straight lines of intersection of the



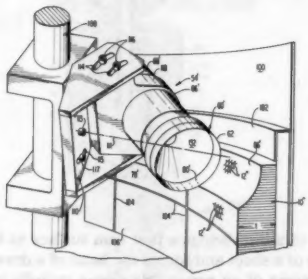
plane generated by the cutting edge during the reciprocating movement of one of the cutters of the tool with a plane parallel to the axis of rotation of the workpiece, which is fixed in relation to said workpiece, be tangent to a given curve of said plane parallel to the axis of rotation of said workpiece.

3,709,094

METHOD OF CUTTING LOW DENSITY MATERIALS AND IMPROVED CUTTER EMPLOYED THEREWITH

Leon E. Laux, Baltimore, Md., assignor to Martin Marietta Corporation, New York, N.Y.

Filed Sept. 15, 1970, Ser. No. 72,293
Int. Cl. B23c 3/00
U.S. Cl. 90—11 C 3 Claims



A high speed, continuously rotating cup-shaped cutter is moved generally parallel to its axis of rotation and against a foamed plastic or honeycomb core billet to sever the honeycomb core cells at generally right angles to their axis, with the plane of the circular cutting edge at some angle to each of the side walls forming the individual core cells.

3,709,095

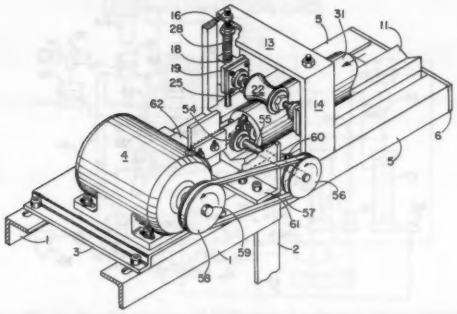
CORE SLOTTING DEVICE

Edward P. Laumer, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 21, 1970, Ser. No. 100,203
Int. Cl. B23c 3/30
U.S. Cl. 90—11 C 6 Claims

A device for slotting or milling an end of a hollow core to provide keyway means on the core extremity. Structure is included for presenting a hollow core endwise to a rotary cutter of a dimension and position such that the center line or axis of

the cutter may lie within the hollow of the core with the core axis extending transverse to the axis of the cutter. The cutter



may be of a diameter to slot out two keyways simultaneously and without penetrating the core periphery.

3,709,096

METAL-CUTTING APPARATUS

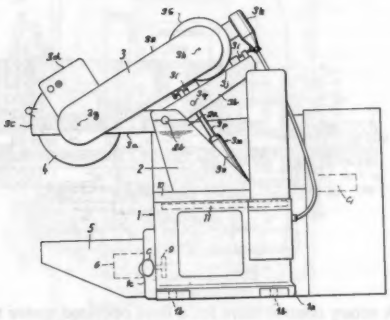
Jost Stender-Robertz, Herzberg/Harz, Germany, assignor to Universal Maschinen-u. Apparatebau GmbH u. Co. KG, Herzberg/Harz, Germany

Filed June 30, 1970, Ser. No. 51,107

Claims priority, application Germany, July 2, 1969, P 69 26 120.7

Int. Cl. B23c 1/12, 3/14

U.S. Cl. 90—15 **9 Claims**



A metal-cutting apparatus, e.g., for the trimming of cast bodies of iron, steel, light metals and heavy metals, wherein a workpiece-support table is shiftable generally horizontally beneath a blade-carrying arm which is swingable in a vertical plane about a pivot axis. The pivot is mounted upon a carriage shiftable horizontally but perpendicular to the direction of movement of the table. Both the table and the carriage are provided with fluid-responsive stressing means for fixing the carriage and the table against play during the cutting operation.

3,709,097

DRILLING SUPPORT FOR A ROCK PERFORATOR

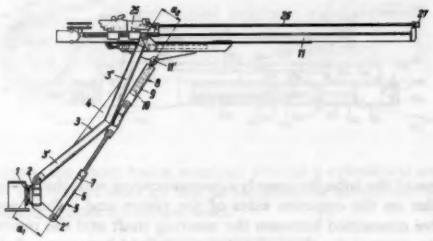
Josef Huszar, and Konrad Schon, both of Kapfenberg, Austria, assignors to Gebr. Bohler & Co. Aktiengesellschaft, Kapfenberg, Austria

Filed June 28, 1971, Ser. No. 157,388

Int. Cl. E21c 5/11

U.S. Cl. 173—44 **8 Claims**

A drilling support for a rock perforator, of the type comprising: a jib on a boring support carrier; a drilling carriage pivotally arranged above the jib; a rock-perforator power-tool slidably arranged on the drilling carriage; a first power drive connected to the boring support carrier for lifting and lowering the drilling carriage and an additional power drive



pivotally connected with the drilling carriage for positioning the drilling carriage. The provision of the additional power drive enables a simple non-telescopic construction to be adapted for the jib, at the same time providing the required maneuverability of the drilling carriage.

3,709,098

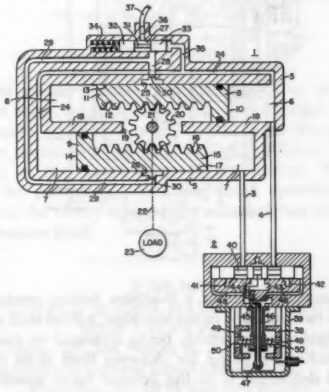
MOTION TRANSMITTING APPARATUS

Wayne B. Lloyd, 214 Brookside Drive, Baltimore, Md.

Filed Feb. 3, 1971, Ser. No. 112,229

Int. Cl. F01m 1/04

U.S. Cl. 91—46 **1 Claim**



Apparatus of the rack and pinion type of hydraulic actuator having low back-lash and friction for converting hydraulic power by a linear to a rotary motion mechanism employing valved hydrostatic lubrication means responsive to the hydraulic pressure to hydraulically support and lubricate the rack with respect to a rack supporting bearing and employing as the lubricant the hydraulic fluid used for transmitting the power.

3,709,099

CONVERTIBLE RACK AND PINION STEERING GEAR

Peter J. Dumeah, Royal Oak, Mich., assignor to TRW Inc., Cleveland, Ohio

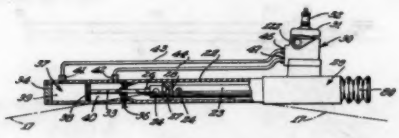
Filed Aug. 11, 1970, Ser. No. 62,924

Int. Cl. F01b 29/04; F15b 9/10

U.S. Cl. 91—54 **10 Claims**

A rack and pinion gear steering assembly constructed and arranged so as to readily accommodate either manual or power steering within the same basic design configuration.

The assembly comprises a steering shaft, a pinion gear, a rack tube which is extended longitudinally to provide a fluid power cylinder, a rack within the tube, a piston rod connected to the rack, a piston mounted on the rod and located within the power cylinder, fluid connections formed on the extended



portion of the tube for openly communicating with the power cylinder on the opposite sides of the piston and a fluid servovalve connected between the steering shaft and the pinion gear to control the flow of pressurized fluid between a fluid pump and the opposite sides of the piston.

3,709,100

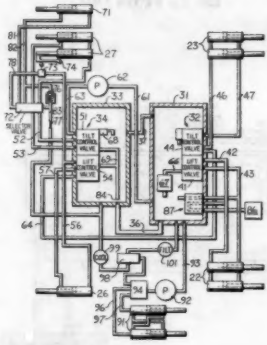
HYDRAULIC IMPLEMENT CONTROL CIRCUIT

Wayne A. Peterson, and Edward A. Wirtz, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 5,577, Jan. 26, 1970, Pat. No. 3,606,051. This application June 11, 1971, Ser. No. 152,443

Int. Cl. F15b *11/16, 13/06*

U.S. Cl. 91—189 **3 Claims**



A hydraulic circuit for a machine having implements arranged on two portions of the machine, a fluid tank and implement control valve assembly being arranged on each portion of the machine, a pump for drawing fluid from one of the tanks and delivering it to the control valve assemblies with conduits for returning exhaust fluid to either of the tanks, a fluid equalizing line and an air equalizing line interconnecting the two tanks to assure an adequate supply of hydraulic fluid in each tank.

3,709,101

FLUID OPERATED MACHINE AND SAFETY CONTROL SYSTEM THEREFOR

Frank H. Richterkessing, 1200 Park Hills Drive, Louisville, Ky.

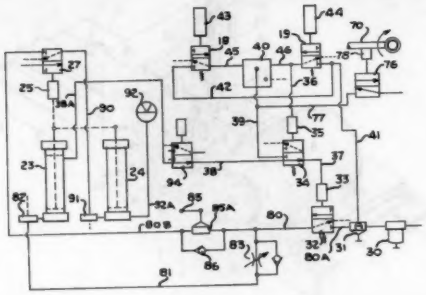
Division of Ser. No. 823,722, May 12, 1969, Pat. No. 3,640,007. This application Jan. 15, 1971, Ser. No. 106,682

Int. Cl. F15b *13/042*

U.S. Cl. 91—424 **1 Claim**

A fluid operated machine having members for applying pressure to a work piece placed therebetween by an operator, which machine is equipped with safety controls to prevent trapping of the hands of the machine operator, or of another person, between the members during closing of the same upon the work piece.

A garment pressing machine employing a valve controlled conduct system with the safety controls included, and without



detracting from the numerous operating capabilities required of a garment pressing machine, is employed to illustrate the invention.

3,709,102

VALVE FOR FLUID OPERATED ROTARY ENGINES

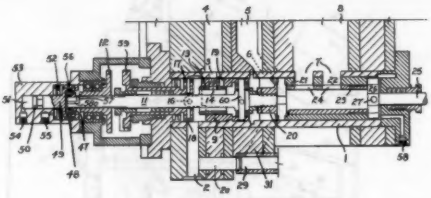
Raydon Ayers Lines, 2 Rasp Avenue, Medindie, Australia

Filed Jan. 27, 1971, Ser. No. 110,097

Claims priority, application Australia, Jan. 29, 1970, PA 0190/70

Int. Cl. F01b *3/00, 13/04*

U.S. Cl. 91—503 **9 Claims**



A rotary control valve for a fluid operated motor the valve having a rotary valve rotor driven at motor speed and a rotationally adjustable valve sleeve in the valve rotor to vary the cut off of admission through the valve. The valves are so dimensioned that fluid pressure maintains contact between the valves at the area of their ports and the valve rotor is adjustable axially for long period admission. Provision is made for the control valve to operate a two stage motor and either series or parallel operation.

3,709,103

DIRECTIONAL CONTROL VALVES FOR THE POWER CYLINDERS OF OPERATING ELEMENTS OF MACHINES

Rafael Gershonovich Dukhovny; Boris Lvovich Magarillo; Alexandr Ivanovich Naidenov; Vladimir Vasilievich Ovcharov, and Nikolai Nikolaevich Potapjuk, all of Chelyabinsk, U.S.S.R., assignors to Chelyabinsky Traktorny Zavod, Chelyabinsk, U.S.S.R.

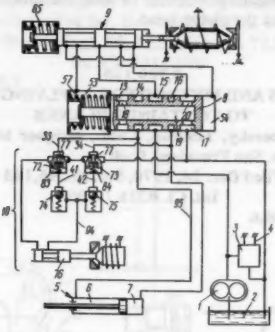
Filed Nov. 10, 1969, Ser. No. 875,118

Int. Cl. F15b *11/08, 13/043*

U.S. Cl. 91—437 **2 Claims**

A directional control valve for the power cylinders of operating elements of machines, particularly, road-building

machines and tractors, wherein the bi-directional floating position of the power cylinder is obtained by the introduction



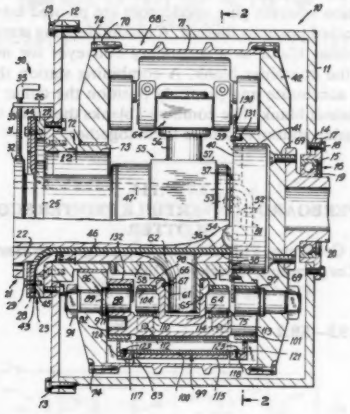
into the hydraulic system of differential valves communicating with non-return valves.

3,709,104

RADIAL PISTON HYDRAULIC PUMP OR MOTOR WITH LOW LOSS REACTION LINKAGE

Donald L. Culberson, Teaneck, N.J., assignor to Jaromir Tobias, Rhinebeck, Dutchess County, N.Y.

Filed March 1, 1971, Ser. No. 119,558
Int. Cl. F01b *1/06, 13/06*
U.S. Cl. 91—495 13 Claims



A radial piston hydraulic pump or motor characterized by a new linkage assembly interposed between the pistons and the reaction assembly. The linkage assembly, in addition to transmitting forces between the pistons and the reaction assembly, also stabilizes the pistons relative to the cylinders. The linkage assembly is characterized particularly by the incorporation of a parallel pair of Scott-Russell linkages, some portion of the parallel pair being guided for linear reciprocal movement by reason of the parallel nature of the links.

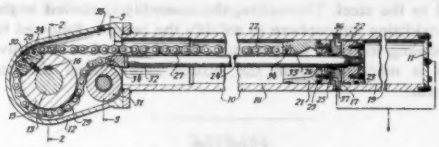
3,709,105

FLUID PRESSURE OPERATED ROTARY ACTUATORS

John Cecil Ridley, Newcourt House, New Street, Lymington, England

Continuation-in-part of Ser. No. 95,572, Dec. 7, 1970. This application July 6, 1971, Ser. No. 159,771
Int. Cl. F01b *9/00*
U.S. Cl. 92—137 7 Claims

A fluid pressure rotary actuator comprises a rotatable output shaft, a cylinder in which two pistons are movable simultaneously in opposite directions by fluid pressure acting on at least one of them, and a chain extending from one piston to a rod fixed to the other piston and passing through the first



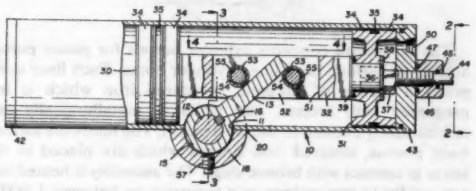
piston, the chain being wrapped around a cylindrical surface on the output shaft so that its longitudinal movement by the pistons rotates the output shaft.

3,709,106

PISTON OPERATOR FOR IMPARTING ROTARY MOTION

Homer J. Shafer, 2300 W. Park Avenue, Mansfield, Ohio

Filed Sept. 14, 1970, Ser. No. 72,018
Int. Cl. F01b *9/00*; F16k *31/16*
U.S. Cl. 92—138 4 Claims



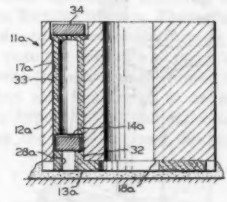
A linear piston operator having a housing made from preformed tubes enclosing two pistons connected in spaced relation, and a crank operatively connected to the piston connector for rotating an element as fluid pressure is applied selectively to the outer faces of the pistons. The cavity between the pistons in which the crank operates communicates with the rotary element and is completely enclosed for storing pressure fluid.

3,709,107

STEEL CYLINDER BARREL HAVING BONDED BRONZE-IRON VALVE PLATE

Martin J. Alger, Jr., and Nelson H. Dunn, both of Watertown, N.Y., assignors to General Signal Corporation

Filed Nov. 27, 1970, Ser. No. 93,297
Int. Cl. F01b *11/02*
U.S. Cl. 92—169 7 Claims



The disclosure concerns steel cylinder barrels for piston pumps and motors having bonded non-steel valve plates. The valve plate comprises a sintered iron powder matrix which is impregnated with bronze and is metallurgically and mechanically bonded to one end of the steel cylinder barrel. The valve plate is made from a porous sintered iron blank which is

mounted in contact with one end of a steel barrel blank in an assembly which includes a mass of bronze in the solid state. The assembly is heated in a non-oxidizing atmosphere to a temperature between 1900°F and 2000°F to melt the bronze and cause it to infiltrate the sintered valve plate blank and bond to the steel. Thereafter, the assembly is cooled in the non-oxidizing atmosphere to solidify the bronze, followed by air cooling to room temperature. Finally, the finished valve plate is machined from the bronze-impregnated sintered preform.

3,709,108

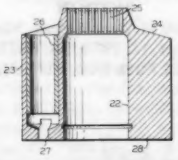
STEEL CYLINDER BARREL HAVING BONDED BRONZE-IRON LINERS

Martin J. Alger, Jr., and Nelson H. Dunn, both of Watertown, N.Y., assignors to General Signal Corporation

Filed Nov. 27, 1970, Ser. No. 93,298

Int. Cl. F01b *11/02*

U.S. Cl. 92—169 **7 Claims**



The disclosure concerns cylinder barrels for piston pumps and motors which have lined cylinder bores. Each liner comprises a matrix of sintered, powdered iron which is impregnated with bronze, and which is metallurgically and mechanically bonded to the steel barrel. The liners are formed from porous, sintered iron sleeves which are placed in the bores in contact with bronze slugs. The assembly is heated in a non-oxidizing atmosphere to a temperature between 1,900°F and 2,000°F to melt the bronze and cause it to infiltrate the sintered preform and bond to the steel. Thereafter, the assembly is cooled in the non-oxidizing atmosphere to solidify the bronze, followed by air cooling to room temperature. Finally, the finished cylinder bores are machined in the bonded bronze-iron sleeves.

3,709,109

PISTON COOLING ARRANGEMENT FOR A RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE WITH AN INJECTION NOZZLE

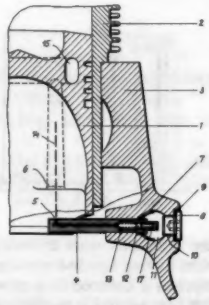
Hans-Ulrich Howe, Bensberg-Frankenforst, Germany, assignor to Kloeckner-Humboldt-Deutz Aktiengesellschaft, Cologne-Deutz, Germany

Filed Nov. 5, 1970, Ser. No. 87,207

Claims priority, application Germany, Nov. 7, 1969, P 19 56 121.8

Int. Cl. F01p *3/10*

U.S. Cl. 92—186 **4 Claims**



A piston cooling device for a reciprocating piston internal combustion engine, which includes a selectively rotatable injection nozzle which selectively directs cooling lubricant against the piston head or another part of the piston, and means for indicating whether or not the lubricant is being directed against the piston head.

3,709,110

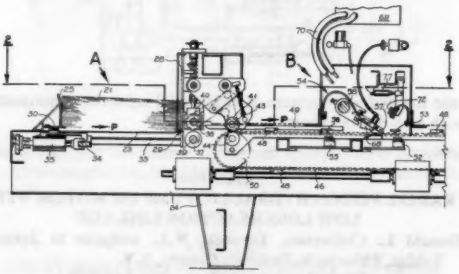
APPARATUS AND METHOD FOR APPLYING COLLARS TO CONTAINER BLANKS

Albert R. Lubersky, Tiburon, Calif., assignor to Fibreboard Corporation, San Francisco, Calif.

Filed Dec. 24, 1970, Ser. No. 96,143

Int. Cl. B31b *17/00*

U.S. Cl. 93—36.6 **17 Claims**



An apparatus comprises a first feeding station for transferring a container blank to a main conveyer for movement along a linear path. The blank is conveyed to an adhesive application station wherein glue applicators are pivoted into contact with selected portions thereof. A second feeding station transfers a collar blank to a secondary conveyer for movement toward the container blank. A combining station then functions to accelerate and precisely position the collar blank on the container blank. The combined blanks then pass through a compression station to secure them together.

3,709,111

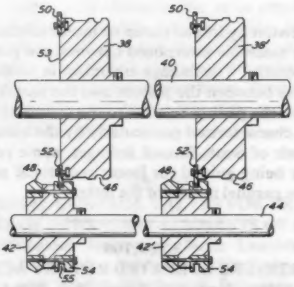
PAPERBOARD CONVERTIBLE PRINTER SCORER SLOTTER

William Grobman, Philadelphia, Pa., assignor to Harris Intertype Corporation, Cleveland, Ohio

Filed Sept. 28, 1970, Ser. No. 76,146

Int. Cl. B31b *1/14*

U.S. Cl. 93—58.2 **4 Claims**

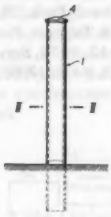


The paperboard printer scorer slotter has a rotatable scoring member between a rotatable slotting member and a rotatable print cylinder. The scoring member has a diameter 50 percent larger than the diameter of the slotting member. Each of the scoring member and slotting member may be used selectively for either scoring or slotting paperboard blanks.

3,709,112
GUIDE PICKET

Georg Ebinger, Eduardgasse 8, Vienna 18, Austria

Continuation-in-part of Ser. No. 768,374, Oct. 17, 1968. This application Sept. 10, 1970, Ser. No. 71,191
Int. Cl. E01f 9/00
U.S. Cl. 94—1.5 **9 Claims**

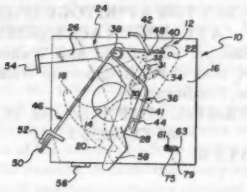


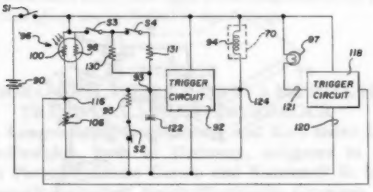
A hollow guide post made of elastic polyethylene and of triangular cross section so that it will right itself after being run over by a vehicle. The post has reflective side surfaces and also has rounded corners which facilitate its ability to right itself. The post is filled, preferably to about ground level, when placed in the ground.

3,709,113
SHUTTER CONTROL MECHANISM

Lawrence M. Wood, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 13, 1971, Ser. No. 179,709
Int. Cl. G03b 9/62
U.S. Cl. 95—10 CT **12 Claims**



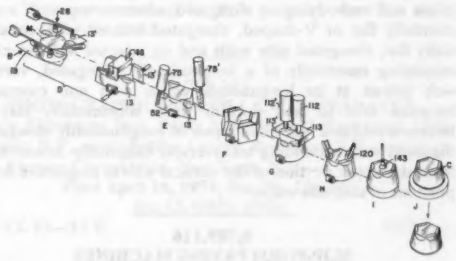


A camera having shutter apparatus operable in two modes for opening and closing an exposure aperture and a third mode for flash photography. The shutter apparatus includes an electronic circuit having photosensitive means for controlling the operating of the electronic circuit as a function of scene light intensity. In the first mode of operation the electronic circuit actuates a detent mechanism when scene light is below a preselected level, for controlling the opening and closing of shutter means in a time interval dependent upon the scene light intensity. In the second mode of operation, when scene light is above the preselected intensity level, the detent is inoperative and the shutter mechanism opens and closes the exposure aperture at a preselected shutter speed. In the third mode of operation the electronic circuit actuates the detent mechanism for a fixed period of time to effect a shutter speed longer than that of the second mode.

3,709,114
CONTAINER FORMING MACHINE

Harry Joseph Johnson, West Paterson; Robert O. Wolfelsperger, Fairfield, and Robert Edgar Davis, Nutley, all of N.J., assignors to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Dec. 4, 1970, Ser. No. 95,154
Int. Cl. B31b 1/30, 1/06, 1/62
U.S. Cl. 93—44 **14 Claims**



An apparatus for fabricating cup-like containers from blanks of paperboard or other foldable sheet material, which containers are characterized by a bottom wall panel of polygonal shape and a side wall formed by two panels which are integrally hinged to oppositely disposed edges of the bottom wall panel so that they may be folded upwardly and the end portions connected by heat seals, the apparatus comprising a series of forming mandrels carried on an endless conveyor which is supported for movement in a horizontal plane with a run thereof advancing past a series of successive work stations at which folding and sealing operations are performed. At the first work station container forming blanks are fed, one by one, from a stack, and positioned on the successive mandrels, with the side wall panels of each blank being folded down about the side walls of the mandrel for engagement by clamp members which are associated with each mandrel. At subsequent stations ends of the side wall panels are heated to activate a seam forming adhesive thereon and seams are formed by folding shoes carried on swinging arms which fold the side wall panels against the mandrels to bring the ends thereof into seam forming relation. Thereafter bottom sealing tabs which are hinged to the bottom forming edges of the side walls are sealed onto the bottom wall panel by folding rollers, the clamps are withdrawn and each formed container is lifted from the mandrel and transferred to an edge wetting and rolling apparatus disposed at the end of the mandrel conveyor, which completes the container and discharges it from the machine.

ERRATUM

For Class 94—1.5 see:
Patent No. 3,709,112

3,709,115

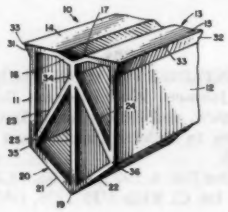
PAVEMENT JOINT SEAL

Delmont D. Brown, North Baltimore, Ohio, assignor to The D. S. Brown Company, Baltimore, Ohio

Continuation of Ser. No. 787,108, Dec. 26, 1968, abandoned. This application Dec. 4, 1970, Ser. No. 95,378

Int. Cl. E01c *11/10*

U.S. Cl. 94—18 **2 Claims**



Elongated, hollow elastomer seals particularly useful for sealing concrete pavement contraction joints or longitudinal joints and embodying an elongated, concave top wall, a substantially flat or V-shaped, elongated bottom wall, substantially flat, elongated side walls and an internal web structure consisting essentially of a longitudinally elongated, vertical web joined at its longitudinal edges with and extending between said to and bottom walls substantially midway between said side walls and a pair of longitudinally elongated, diagonal webs extending transversely diagonally downwardly from the upper portion of the vertical web to respective lower portions of said side walls.

3,709,116

SLIP-FORM PAVING MACHINES

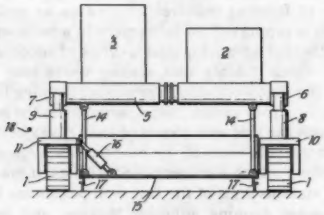
John Edgar Whitbread, London, and Ronald Leslie Attwell, Dorchester-on-Thames, both of England, assignors to British Railways Board, London, England

Filed Feb. 26, 1971, Ser. No. 119,089

Claims priority, application Great Britain, Mar. 2, 1970, 9814/70

Int. Cl. E01c *19/48*

U.S. Cl. 94—46 AC **17 Claims**



A surface forming machine has a conforming member for conforming a surface of a roadway which is adjustable laterally of the machine. A sensing device is mounted for lateral movement with the conforming member for sensing a datum controlling the lateral position of the conforming member. Actuating means cause lateral adjustment of the conforming member to maintain the sensing device centered with respect to the datum. Programmed control means driven in synchronism with the movement of the machine along the roadway cause movement of the sensing device laterally relatively to the conforming member, whereby the consequent lateral adjustment of the conforming member by the actuating means to restore the sensing device to its centered position with respect to the datum varies the relationship between the lateral position of the conforming member and the datum. Similar sensing devices and programmed control means can be provided for controlling the vertical height and transverse and longitudinal attitudes of the conforming member.

ERRATUM

For Class 95—10 CT see:
Patent No. 3,709,113

3,709,117

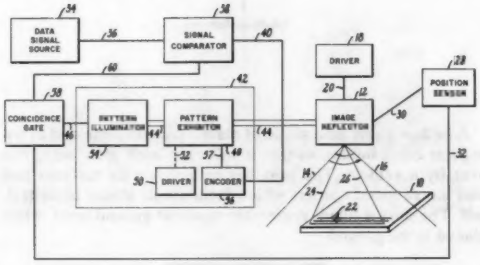
INFORMATION RECORDING METHOD AND SYSTEM

Ronald P. Sansone, Floral Park, N.Y., assignor to Watson Leavenworth Kelton & Taggart, New York, N.Y.

Filed Oct. 12, 1970, Ser. No. 79,953

Int. Cl. B41b *17/00, 21/22*

U.S. Cl. 95—4.5 R **14 Claims**



A photographic record of information contained in a sequence of data signals is provided by successive enabling of a generator providing visual images in a common optical path during time periods according with predetermined projecting relations between a cyclically movable reflector in such light path and a film member and operating such enabled generator upon coincidence of data signal information content and generator image-providing capability.

3,709,118

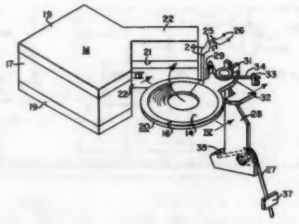
INTEGRAL MECHANICALLY ACTUATED ELECTRICAL POWER SOURCE FOR A PHOTOGRAPHIC CAMERA OR A FLASHGUN ACCESSORY

William E. Shoupp, Pittsburgh, and Walter V. Bratkowski, McKeesport, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 27, 1970, Ser. No. 15,139

Int. Cl. G03b *15/03*

U.S. Cl. 95—11.5 R **15 Claims**



The energy required to operate an electrical device, such as a photoflash lamp, associated with a camera is produced by a mechanically actuated electrical generator which constitutes an integral part of the camera and thus eliminates the need for batteries. The generator is spring-driven and comprises a stationary permanent magnet and a flat coil of insulated copper wire that is rapidly propelled a short distance along a path such that the coil cuts the magnetic lines of flux in the gap between the pole pieces of the magnet and produces a voltage pulse of sufficient magnitude to energize the photoflash lamp or other device. The generator is automatically primed for use

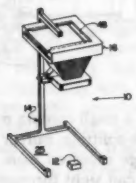
when the shutter is cocked (or the film is advanced) and is then automatically actuated when the shutter-release mechanism is tripped. In the case of a photoflash lamp, the generated voltage pulse is so synchronized relative to the movement of the shutter that the fired lamp reaches peak light output while the shutter is in its aperture-open position. The wire coil is fastened to the camera shutter or a separate swingable member. Alternatively, the coil is wound in tubular form and is stationary and the magnet is moved relative to the coil. A flashgun having an integral manually operated electrical generator which charges a condenser that is discharged through a circuit controlled by the shutter-release mechanism and ignites a flashlamp in synchronism with the operation of the shutter is also disclosed.

3,709,119

CLOSE-UP PHOTOGRAPHIC SYSTEM

Jan Van Der Meer, Volthebrink 30, Enschede, Netherlands

Filed April 16, 1971, Ser. No. 134,679
Int. Cl. G03b *19/02*
U.S. Cl. 95—11 R **23 Claims**



A simple relatively inexpensive "close-up" device or system for easily and accurately photographing, at short range, such subjects as book illustrations, drawings, letters, flowers, various small objects, etc. The system is primarily intended to permit the employment therein, optionally, of either of two widely used, low-priced, self-processing cameras, of types manufactured by Polaroid Corporation, in conjunction with novel mounting-stand means. The latter cooperates with recessed channeled portions of the camera back to enable firm and correct mounting of the camera. A combined supplemental close-up lens and photocell aperture-reducing element, a flash unit, a color-correction filter, and light-polarizing means for reducing reflected glare are included in the system.

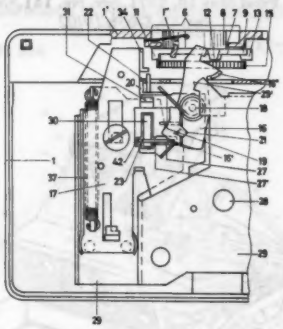
3,709,120

PHOTOGRAPHIC CAMERA HAVING A MUTUAL FILM-TRANSPORT AND EXPOSURE LOCK

Wilhelm Langewiesche, Regensburg, and Karl Heinz Lange, Bunde-Ennigloh, both of Germany, assignors to Balda Werke Photographische Gerate und Kunststoff R. Gruter Kommanditgesellschaft, Bunde/Westphalia, Germany

Filed May 28, 1970, Ser. No. 41,334
Claims priority, application Germany, June 2, 1969, P 19 28 034.3
Int. Cl. G03b *19/04, 1/62*
U.S. Cl. 95—11 R **17 Claims**

A film feed and lock arrangement for photographic cameras equipped with flash cube provisions. A locking slider locks the film feed when in a first or initial position. Upon actuation of the release button of the camera and transfer of the slider to a second position, the film feed is released, with the slider contacting a surface on the release button in front of a locking edge on the button. Upon return of the release button to its initial or unactuated position, the locking slider contacts the surface behind the locking edge. After return of the release button through its initial and unactuated position, the button is locked in place by the slider. After the film feed mechanism has been actuated, the slider is returned to its first or initial



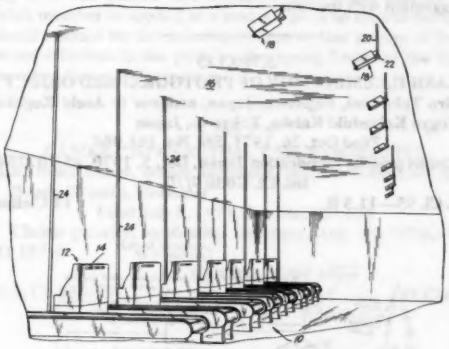
position and thereby unlocks the release button. Once the slider has again reached its first position, the film feed becomes locked in place.

3,709,121

PHOTOGRAPHIC SURVEILLANCE APPARATUS

Harris Simonson, New York, N.Y.; Ronald Engleman, Elmhurst, N.Y., and Sheldon Levine, Brooklyn, N.Y., assignors to Comsec Corporation, New York, N.Y.

Filed April 16, 1971, Ser. No. 134,627
Int. Cl. G03b *29/00*
U.S. Cl. 95—11 R **9 Claims**



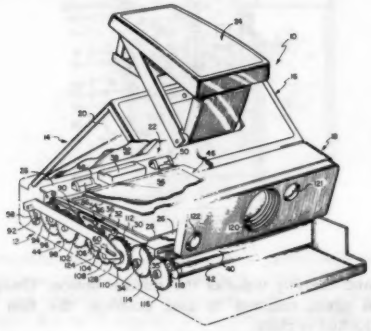
A photographic surveillance apparatus for carrying out surveillance of cash register operations. A cash register with goods in the vicinity thereof is photographed by a camera situated at a distance from the cash register sufficiently great to prevent individuals in the vicinity of the cash register from being distracted by the camera. The camera is a motion picture camera which is operated in a single-frame mode at least when the totalizing key of the cash register is operated. In this way the total cost of the items as introduced into the cash register and the items themselves are photographed so that a correlation can be made between the goods and the total cost thereof. The motion picture camera is triggered to expose a single frame by a solenoid actuated through a trigger circuit which in turn is actuated from the cash register, with a delay being incorporated into the operation of the trigger circuit to provide a sufficient interval for the numerals to appear at the cash register before these numerals are photographed.

3,709,122

FILM ADVANCING APPARATUS

Igor Blinow, Millis, and Robert D. Leduc, Marlboro, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 10, 1971, Ser. No. 141,553
Int. Cl. G03b 19/02
U.S. Cl. 95—11 R 14 Claims



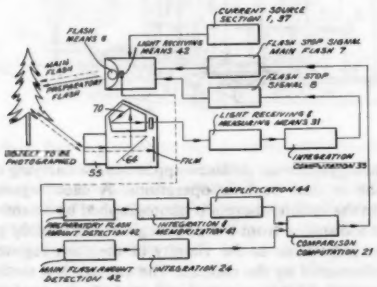
Photographic apparatus including a motor mounted near one end of a film positioning structure, a pair of rolls mounted adjacent an opposite end of the positioning structure and an elongated gear train extending between the motor and the rolls and along a side of the film positioning structure. Film-advancing apparatus is actuated by a component of the gear train to move an exposed film unit from its exposure position within the positioning structure into the bite of the rolls for subsequent movement of the film unit toward the exterior of the apparatus. A latch is provided for disenabling the film-advancing apparatus from moving another film unit from its exposure position until the preceding film unit has moved out of engagement with the rolls.

3,709,123

FLASH ILLUMINATION OF PHOTOGRAPHED OBJECT

Seijiro Tokutomi, Fujisawa, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Oct. 26, 1971, Ser. No. 191,984
Claims priority, application Japan, Dec. 5, 1970, 45/107754
Int. Cl. G03b 9/70
U.S. Cl. 95—11.5 R 11 Claims



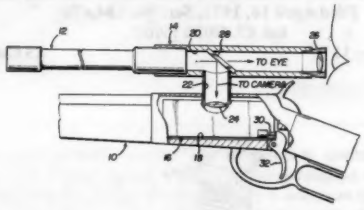
A structure for providing a controlled flash illumination of an object which is to be photographed. A source of flash illumination first illuminates the object with a preparatory flash and then, during film-exposure, with a main flash. A preparatory control structure is electrically connected with the flash source for terminating the preparatory flash when the latter produces an amount of light which has a given relation with respect to the amount of light required to be subsequently produced during the main flash in order to achieve a proper film exposure. The amount of light produced during the preparatory flash illumination is electrically stored as a first electrical quantity, and the flash source is controlled during main flash illumination to produce a second electrical quantity corresponding to the amount of light produced during the main flash illumination, with the second quantity being compared to the first quantity. As a result of this comparison the main flash control structure automatically terminates the main flash when the amount of light produced thereby has the required relationship with respect to the amount of light produced during the preparatory flash illumination.

3,709,124

GAME RIFLE CAMERA

R. Brian Hunt, 17515 W. Nine Mile Road, Rochester, Mich.

Filed Sept. 9, 1971, Ser. No. 179,095
Int. Cl. G03b 29/00
U.S. Cl. 95—12 1 Claim



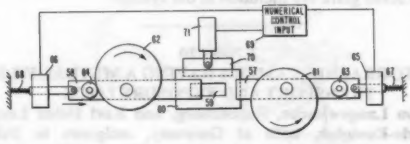
A simulated rifle has a small camera mounted in its receiver portion, and an image-splitting mirror mounted above the receiver splits the image received from a telescopic sight so that the photographer can sight through the mirror and telescopic sight while the image is simultaneously reflected by the mirror to the camera lens. The picture may be taken by pulling the trigger of the rifle, which is connected to the camera shutter.

3,709,125

PHOTOGRAPHIC LINE TRACING APPARATUS

John P. Wiley, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 1, 1971, Ser. No. 148,430
Int. Cl. G03b
U.S. Cl. 95—12 12 Claims

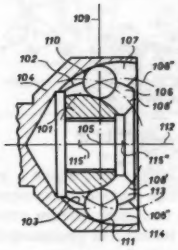


An optical system having a light source, condensing lens and projection lens for tracing lines on a moving photosensitive plate which is provided with a rectangular apertured reticle positioned between the condensing lens and projection lens for defining the line to be traced and a pair of field shutters independently movable adjacent said reticle. One shutter normally completely covers the aperture and the other shutter normally completely uncovers the aperture. Said one shutter is moved in synchronism with the moving plate to uncover the aperture and start tracing a line and said other shutter is moved in synchronism with the moving plate to cover the aperture to terminate a line being traced whereby uniform exposure is provided throughout the entire length of the line being traced.

3,709,126
CAMERA WITH STRIPPING MECHANISM

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,472
Int. Cl. G03b 17/52
U.S. Cl. 95—13 4 Claims

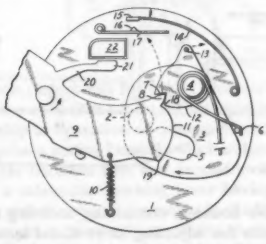


A camera having a stripping mechanism for separating an image-recording portion of a self-processing film unit from waste material after processing has been initiated. The mechanism has particular utility with film units wherein the recording portion is strippably coupled to a rigid frame and also to a cooperating pod and trap. Stripping of the recording portion from the frame, pod and trap is effected by one or more stripping fingers of the mechanism that are adapted to be inserted between the recording portion and the frame to separate the recording portion from the frame, pod and trap. The finished print is constructed in the recording unit and, after the above-mentioned stripping, is substantially unencumbered by other elements of the film unit necessary only for processing.

3,709,127
CAMERA SHUTTER

Vincenzo Milanese, and Angelo Bianchi, both of Ceva, Italy, assignors to Ferrania S.p.A., Milan, Italy

Division of Ser. No. 736,203, June 11, 1968, abandoned. This application July 16, 1970, Ser. No. 62,759
Claims priority, application Italy, June 14, 1967, 37470 A/67
Int. Cl. G03b 9/10, 21/26
U.S. Cl. 95—31 FL 2 Claims

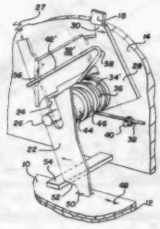


A camera shutter having electrical contact means for energizing flashbulbs and double exposure prevention means is shown.

3,709,128
FILM METERING MECHANISM

David E. Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed March 16, 1972, Ser. No. 235,143
Int. Cl. G03b 1/62
U.S. Cl. 95—31 FM 5 Claims

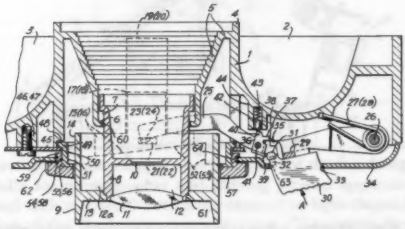


A camera for roll film perforated at predetermined metering intervals includes a transport mechanism for advancing the film along an exposure plane and metering system for stopping film transport when the film is correctly positioned for exposure. The metering system includes a metering lever movable between an active position disabling the transport mechanism and an inactive position, a film sensing pawl spaced from the metering lever and mounted for movement between a retracted position resting on the film surface and extended positions while in a film perforation and a latch member which is mounted for blocking or releasing the metering lever and which is coupled to the sensing pawl. The latch member is spring biased so as to urge the sensing pawl into pressure engagement with the trailing edge of a film perforation and is movable by the sensing pawl to a position in which the metering level can disable film transport. The spring bias on the latch member is applied in a manner so as to reduce the frictional restrain on the metering system so that a serge of force is not released to the pawl by the spring force on the latch member during film exposure.

3,709,129
CAMERA WITH RETRACTABLE OBJECTIVE

Karl-Heinz Lange, Bunde, Germany, assignor to Balda-Werke, Bunde (Westf.), Germany

Filed July 8, 1971, Ser. No. 160,674
Claims priority, application Germany, Aug. 19, 1970, P 20 41 187.4
Int. Cl. G03b 17/04
U.S. Cl. 95—39 21 Claims



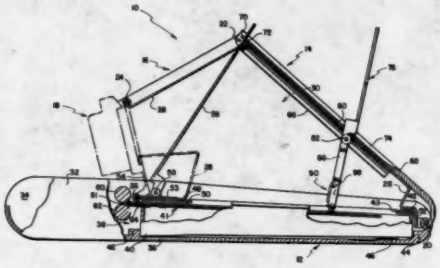
A camera having an objective which is retractable from an outer operating position to an inner inoperative position. A manually operable structure coacts with the objective for giving the operator the capability of controlling the movement of the objective both inwardly to its inoperative position and outwardly to its operative position.

3,709,130

ERECTING LINKAGE

Lawrence M. Douglas, Eastondale, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 4, 1971, Ser. No. 186,025
Int. Cl. G03b 17/04
U.S. Cl. 95—39 8 Claims



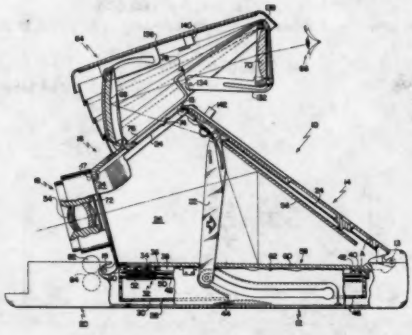
Photographic apparatus of the collapsible type including a plurality of sections movable between a compact, collapsed position and an extended, operative position. An erecting link is pivoted at one end to one of the sections and is adapted to be detachably secured to another of the sections for maintaining and supporting the sections in the erected, operative position. One of the sections includes a recess for receiving a hand-engageable portion of a film-advancing apparatus when not in use. When the photographic apparatus is collapsed, the erecting link is pivoted into the recess in overlying relation to the hand-engageable portion of the film-advancing apparatus to prevent actuation of the latter.

3,709,131

METHOD AND APPARATUS FOR ALIGNING A VIEWING SYSTEM

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1971, Ser. No. 213,020
Int. Cl. G03b 13/10, 17/04
U.S. Cl. 95—39 29 Claims



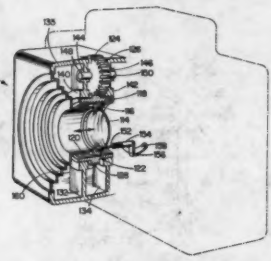
A photographic apparatus having a variable geometry housing, an optical system, operative in a viewing mode for providing an image, mounted on the housing such that the performance of the optical system in terms of image brightness depends upon the geometry of the housing, and an assembly for adjusting the geometry of the housing for optimum image brightness. A method is also presented for observing the alignment of the optical system and adjusting the same.

3,709,132

PHOTOGRAPHIC FOCUS ADJUSTMENT APPARATUS

George J. Farrell, Bedford; Walter R. Lyon, West Roxbury, both of Mass.; Loring K. Mills, Hampton, N.H., and Reginald O. Shaw, Westhampton, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 27, 1970, Ser. No. 93,340
Int. Cl. G03b 3/02
U.S. Cl. 95—45 3 Claims



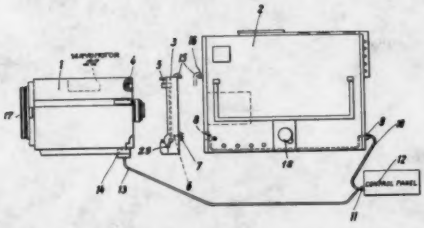
Photographic focus adjustment apparatus for varying the axial position of a camera objective lens or lens element is disclosed in each embodiment as comprising lens carriage means having external threads, lens carriage support means having internal threads mating with the threads on the lens carriage means, sliding key means for preventing rotation of the carriage means with the carriage support means while providing freedom of axial movement of the carriage means, and manually operable actuating means for effecting selective rotation of the carriage support means to cause the carriage means and thus the lens (or lens element) to move along its axis. In one embodiment depicted the carriage support means, as well as the carriage means, moves axially upon rotation thereof in such a way as to obviate exposure of any threads to atmospheric dust and other foreign matter. In another embodiment disclosed, contamination of the threads is avoided by the provision of an expansible bellows between the lens carriage means and the camera housing.

3,709,133

ADAPTER FOR TELEVISION CAMERA

Karl Gunter Hess, Waldlaubersheim, and Kurt Werner, Munster-Sarmsheim, both of Germany, assignors to Jos. Schneider & Co., Bad/Kreuznach/Rhineland, Germany

Filed May 25, 1971, Ser. No. 146,660
Claims priority, application Germany, April 21, 1971, P 20 25 960.3
Int. Cl. G03b 3/10
U.S. Cl. 95—45 3 Claims



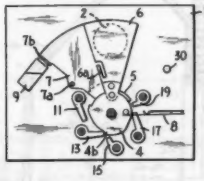
An objective housing, containing zooming mechanism including a motor for adjusting its varifocal lens assembly, has its rear wall fitted with a socket for engagement by an electrical connector or an adapter plate which is similarly connectable to an electric outlet for a TV camera to be coupled with the objective by means of this plate. A central aperture in the adapter plate for gives passage to light rays entering the camera through the lens assembly.

3,709,134

LENS SHUTTER FOR A SINGLE LENS REFLEX CAMERA

Kiyoshi Kitai, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan

Filed Sept. 15, 1970, Ser. No. 72,259
Int. Cl. G03b 9/16
U.S. Cl. 95—60 6 Claims



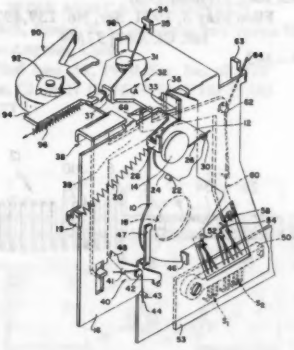
A lens shutter for a single lens reflex camera having two pivotally mounted superposed sectors operable, in timed relationship with a camera mirror, from one side of a shutter or exposure aperture sequentially in a similar sequence each first closing the exposure aperture and then opening it during travel, in a common direction, to an opposite side of the exposure aperture for taking an exposure. A delay or timing circuit is provided for controlling the exposure time by one of the sectors. The timing with the mirror is such that in effect one sector opens the shutter and the other closes it.

3,709,135

SHUTTER CONTROL APPARATUS

Horst Simon, and Wilhelm Birkenmaier, both of Stuttgart, Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 14, 1971, Ser. No. 152,920
Claims priority, application Germany, June 16, 1970, G 70 22 584.2
Int. Cl. G03b 7/08, 9/58
U.S. Cl. 95—60 2 Claims



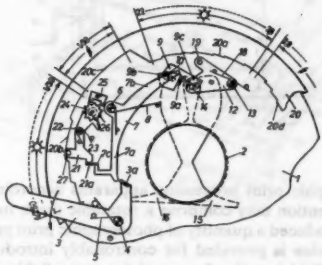
Switch actuating apparatus for use in a camera of the type including switch means that are to be actuated in a predetermined relationship to operation of camera shutter means. The apparatus includes a spring biased, switch actuating member which is movable between first and second switch actuating positions, and a releasable latching lever having a first arm that retains the switch actuating member in the first switch actuating position prior to operation of the shutter means. A second arm of the latching lever is positioned to be contacted by the operated shutter means. The contact of the second arm by the shutter means moves the first arm out of the retaining position of the switch actuating member, and the switch actuating member moves, under the spring bias, to the second switch actuating position.

3,709,136

PHOTOGRAPHIC SHUTTER

Helmut Straub, Hofen/Enz., Germany, assignor to Prontor-Werk Alfred Gauthier, G.m.b.H., Calmbach/Schwarzwald, Germany

Filed Jan. 29, 1971, Ser. No. 110,944
Claims priority, application Germany, Feb. 7, 1970, P 20 05 718.5
Int. Cl. G03b 9/14, 9/70
U.S. Cl. 95—62 9 Claims



An improved photographic shutter mechanism has a driving force which operates exposure aperture defining segments and also operates a first and second mechanical part. The second part, operatively connected to the aperture defining segments, is spring biased to follow the movement of the first part.

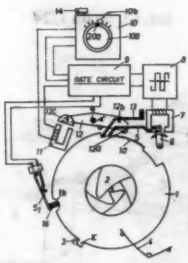
A setter mechanism is provided with respective control cam surfaces which coact with the first and second parts to determine the time of shutter operation and the extent of the aperture defined by the segments.

3,709,137

AUTOMATIC SHUTTER CONTROLLING DEVICE PARTICULARLY FOR PHOTOGRAPHIC AND MOVING PICTURE APPARATUS

Franz W. R. Starp, Calmbach/Black Forest, Germany, assignor to Prontor-Werk Alfred Gauthier G.m.b.H., Calmbach/Schwarzwald, Germany

Filed April 9, 1970, Ser. No. 26,961
Int. Cl. G03b 9/06, 7/10
U.S. Cl. 95—64 D 14 Claims

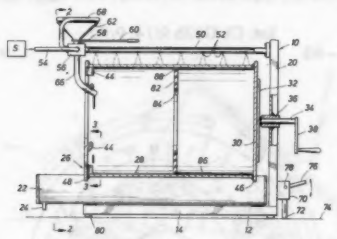


An automatic diaphragm aperture control device designed especially for photographic and moving picture apparatus is provided with a control device for manual or light-dependent selection of the diaphragm aperture value. The control device has a step-by-step electromagnetic mechanism for the control of the diaphragm aperture value and a pulse generator operably connected to the step-by-step electromagnetic switch mechanism for actuation thereof to control the diaphragm aperture value. An electrical gate circuit is placed before the pulse frequency generator to allow the generator to execute a predetermined number of switching steps.

3,709,138
PHOTOGRAPHIC PRINT PROCESSING APPARATUS

Leonard E. Brasher, 3936 Harris Drive, Corpus Christi, Tex.

Filed May 21, 1971, Ser. No. 145,606
Int. Cl. G03d 3/08
U.S. Cl. 95—93 17 Claims

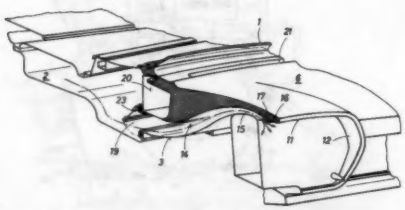


Photographic print processing apparatus according to the present invention may comprise a rotatable drum into which may be introduced a quantity of photographic print processing fluid. A device is provided for controllably introducing the processing fluid into the drum and for controllably introducing water or other appropriate fluid for the washing of photographic printing papers at appropriate stages during the development process. The apparatus may be powered manually or may be provided with a motor drive mechanism to achieve selective rotation of the drum during processing. The drum may be rotated in one direction for processing and may be rotated in the opposite direction for expelling the processing fluid from the drum into a reservoir provided to contain the expelled fluid. Selective directional rotation of the drum may be achieved by the reversible electric motor that may be actuated by mercury switches positioned on an actuating lever which switches are selectively actuated to energize the motor depending upon relative positioning of the lever as the lever is actuated for control purposes.

3,709,139
DEVICE FOR SUPPLYING AIR INTO THE INTERIOR OF MOTOR VEHICLES

Franz G. Behles, Ingolstadt, Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Ingolstadt, Germany

Filed Nov. 20, 1969, Ser. No. 878,400
Claims priority, application Germany, Nov. 27, 1968, P 18 11 286.2
Int. Cl. B60h 1/24
U.S. Cl. 98—2.16 1 Claim

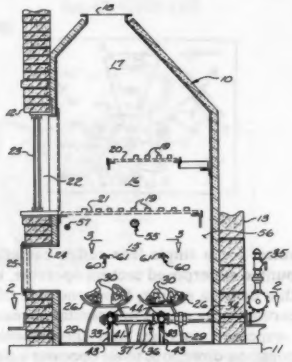


A device for supplying air into the interior of motor vehicles has an air tank located below the air flow and a substantially horizontal dashboard cover having an edge extending beyond the dashboard toward the interior of the vehicle. The dashboard is provided with air outlets. The device is particularly characterized by two air flow conduits connecting the air tank with the interior of the vehicle. These conduits open into the interior with nozzles located below the edge of the switch board cover.

3,709,140
BARBECUE PIT

Leo J. Rickhoff, Jr., St. Louis, Mo., assignor to Tennessee Jed's Franchise Corp., St. Louis, Mo.

Filed Jan. 22, 1971, Ser. No. 108,746
Int. Cl. A23b 1/04
U.S. Cl. 99—331 8 Claims

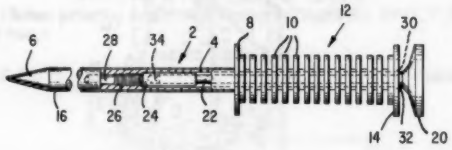


This barbecue pit includes a firebox having a pit portion housing gas burner units; log grates; and a flame quenching system. The gas burner units, which include drip protecting guards, provide the primary cooking heat source and are located below the log grates and sufficiently close to the logs to ensure that they will smolder and impart smoke flavoring to the cooking products. The quenching system which allows smoldering of the logs without excessive flame-up may be operated semi-automatically by a push button or fully automatically by a flame sensitive element.

3,709,141
COOKING INSTRUMENT

Frederick Schwartzstein, Trenton, N.J., assignor to Blackstone Industries, Inc., Trenton, N.J.

Filed May 3, 1971, Ser. No. 139,497
Int. Cl. A47j 37/04
U.S. Cl. 99—343 2 Claims



A heat transmitting device for conducting heat into the interior of a roast or other body of food to aid in the rapid and more uniform cooking thereof, is provided with a probe for insertion into the food and has heat absorbing fins or elements connected thereto for transmitting heat to the probe to raise its temperature up to or approaching the temperature of an oven or other space in which food being cooked is located. A temperature responsive device located within the heat transmitting probe is connected to a thermometer or other indicating device to indicate the temperature of the food adjacent to the probe whereby it is possible to determine whether the food is being uniformly and satisfactorily cooked.

3,709,142

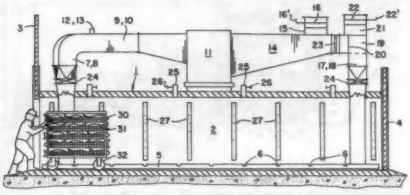
MULTI-PURPOSE COOKER

Ernest W. Peterson, Los Alamitos, Calif., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 689,556, Dec. 11, 1967, Pat. No. 3,594,196. This application Sept. 18, 1970, Ser. No. 73,448

Int. Cl. A23b *3/06*

U.S. Cl. 99—357 7 Claims



A method of preparing fish for canning and apparatus for use in the method which prevents dehydration and retards enzymatic and oxidative deterioration of the fish from the time of evisceration through precooking and cooling. The apparatus comprises a chamber having suitable means for refrigerated holding, precooking and cooling of fish. After the fish are eviscerated, they are placed in the chamber under refrigerated conditions to retard deterioration and to attain a substantially uniform temperature throughout the fish. The fish are then subjected to the precooking operation which due to the initial uniform temperature of the fish are precooked, they are cooled either by recirculating water saturated refrigerated air through the chamber or by initially utilizing evaporative cooling and thereafter recirculating water saturated refrigerated air through the chamber to cool the fish to a desired temperature.

3,709,143

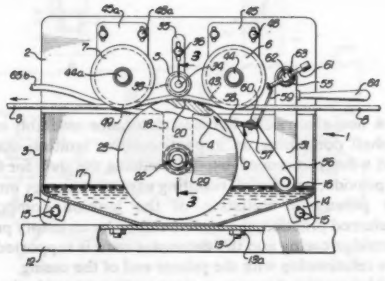
WIRE AND CABLE PRINTER

James R. Rundell, Rome, N.Y., assignor to Cyprus Mines Corporation, Los Angeles, Calif.

Filed Aug. 31, 1970, Ser. No. 68,078

Int. Cl. B41f *17/10, 9/10;* F16j *15/40*

U.S. Cl. 101—37 3 Claims



A wire and cable printing machine having a printing roller adapted to print on a wire or cable passed over an upper portion of the wheel's periphery, including a pair of outer guide rollers on each side of the printing roller for guiding the wire or cable in printing contact with the printing roller and an upper back-up roller between the outer guide rollers for guiding the wire or cable therebetween and for positioning the wire or cable in printing contact with the printing roller.

3,709,144

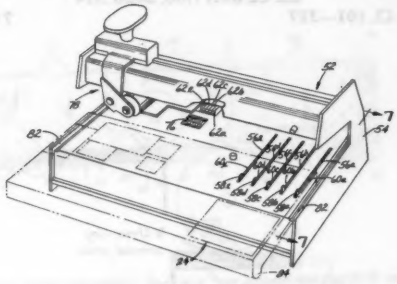
DATA BOARD AND DATA RECORDING MACHINE

Art T. Sims, Gates Mills, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Nov. 10, 1971, Ser. No. 197,547

Int. Cl. B41f *3/20;* B41j *5/06*

U.S. Cl. 101—45 13 Claims



A data board and data recording machine. The data board is insertable into the data recording machine. The data board has operator positionable stop means and the data recording machine has printing wheels connected to sensing rods; the sensing rods sense the position of the stop means and set the printing wheels in response thereto. A printing member plate and print receiving form are carried by the board and the information on the printing wheels and plate are printed on the form.

3,709,145

TICKET ISSUING AND LIKE MACHINES

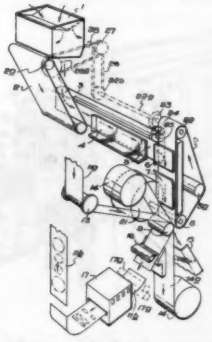
Frank Miles Williamson, Marple, England, assignor to Alfred Williamson Limited, North Hill, England

Filed Aug. 3, 1970, Ser. No. 60,546

Claims priority, application Great Britain, Aug. 6, 1969, 39,376/69; April 7, 1970, 16,293/70

Int. Cl. B41l *1/12, 5/14*

U.S. Cl. 101—66 8 Claims



A ticket and receipt issuing machine in which coins of any denomination to give the required total are inserted into a hopper in the machine casing and passed through means for reproducing an image of the coins on a ticket paper and means for delivering the ticket from the machine.

3,709,146

SHEET CONVEYOR AND PRINTER WHICH OUTSTACKS AND PRINTS SELECTED SHEETS

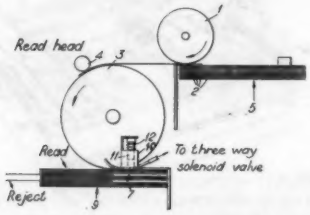
Colin Gray, London, England, assignor to Crosfield Business Machines Limited, London, England

Filed June 8, 1970, Ser. No. 44,106

Claims priority, application Great Britain, June 10, 1969, 29,298/69

Int. Cl. B41f *1/06*; B65h *5/24*

U.S. Cl. 101—317 **7 Claims**



The invention relates to sheet feeding apparatus in which documents are fed one by one past a read head by a vented rotating vacuum drum. A selected document is separated from the arrival stack of documents without loosing the original sequence by applying a braking force to the document before it reaches its final position in the second stack. The document is therefore brought to rest in its allotted position within the original sequence but with its trailing edge protruding from the second stack.

3,709,147

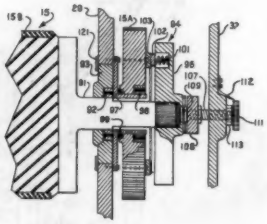
INK TRANSFER CYLINDER MOUNTING WITH ADJUSTABLE DRIVE CLUTCH

Wallace H. Granger, P.O. Box 157, Kentfield, Calif.

Continuation-in-part of Ser. Nos. 735,388, June 7, 1968, Pat. No. 3,585,932, and Ser. No. 650,453, June 30, 1967, abandoned, and continuation-in-part of Ser. No. 38,163, May 18, 1970, Pat. No. 3,587,463. This application Dec. 3, 1970, Ser. No. 94,781

Int. Cl. B41f *31/06*

U.S. Cl. 101—351 **8 Claims**



In a rotary newspaper printing press having only a single ink transfer cylinder or form roller, such cylinder is gear driven through a clutch disposed outside of the press frame in an oil bath and external adjustment means controls clutch pressure. The ink transfer cylinder is mounted for controlled translation in a single plane normal to a common plane of the axes of the inking cylinder and plate cylinder and the clutch mechanism accommodates such movement while maintaining gear drive connection of the ink transfer cylinder.

3,709,148

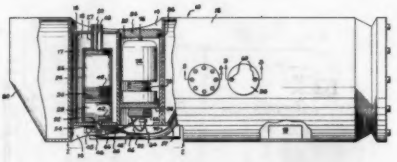
DRILL MINE

Vivian G. Costley, Kensington Heights, Md., and Sylvan Wolf, Silver Spring, Md., assignors to the United States of America as represented by the Secretary of the Navy

Filed April 1, 1971, Ser. No. 130,141

Int. Cl. F42b *22/00*

U.S. Cl. 102—10 **5 Claims**



A drill mine, having the same operational and physical characteristics as a service mine is provided with apparatus for indicating mine actuation and for providing retrieval thereof. A buoyant float assembly is provided which shortly after water entry separates from the drill mine body but remains tethered thereto. Upon mine actuation a smoke generating signal float is released from the float assembly and rises to the surface thereby giving an indication of mine actuation. After a preset time, the float assembly is released from its tethered mode and floats to the surface carrying a recovery line therewith. Upon surfacing, recovery personnel may use the recovery line to remove a heavy retrieval line stored and fixed within the mine case. The retrieval line is employed to pull the mine from the bottom onto a recovery vessel.

3,709,149

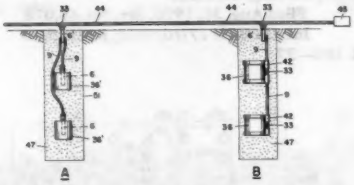
DETONATOR ASSEMBLY, AND BOOSTER AND BLASTING SYSTEM CONTAINING SAME

Hiram E. Driscoll, Hurley, N.Y., assignor to Hercules Incorporated, Wilmington, Del.

Filed March 20, 1970, Ser. No. 21,305

Int. Cl. F42b *3/10*; F42d *1/04*

U.S. Cl. 102—22 **11 Claims**



A non-electrically initiated detonator assembly comprising a shell containing an impact-sensitive ignition composition, and a detonator cord disposed outside the shell for detonation to provide, and direct, resulting explosive energy into the shell for percussion initiation of the ignition composition. In preferred practice, the shell is closed by an empty primed rifle cartridge casing and the detonator cord is supported in operative relationship with the primer end of the casing.

Also provided is an non-electrically initiatable detonator assembly containing the impact-sensitive charge and including means for support of the detonator cord in the requisite detonating relationship.

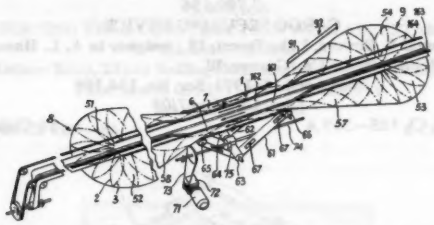
Further provided is a booster unit containing a detonator assembly above described; and a pattern shooting system containing a plurality of the booster assemblies and providing for reduced above-the-ground trunk line noise, eliminating need heretofore for delay means in the down line(s) and providing for assembly of a plurality of boosters in each bore hole on a single down line.

3,709,150

VARIABLE SPEED ENDLESS CONVEYOR

Pierre Colombot, 32, avenue de Bretigny, Saint-Michel-sur-Orge, France

Filed Dec. 2, 1970, Ser. No. 94,425
Claims priority, application France, Dec. 4, 1970, 6941465
Int. Cl. B65g 17/06
U.S. Cl. 104—25 21 Claims



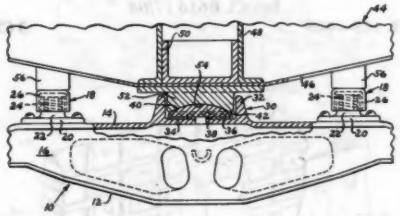
The conveyor is constituted by an endless chain in the form of a horizontal closed loop. It is formed by at least one set of bars comprising a first series of bars and a second series of bars elastically deformable in the horizontal plane but rigid in the vertical plane, the bars of the first series being articulated on the bars of the second series, on one hand in the vicinity of the ends and on the other hand in the vicinity of the middle, thereby forming an uninterrupted sequence of curvilinear diamonds so that the four sides of a given diamond are obtained by means of four different bars. Means are provided for driving the chain, at low speed in at least two zones of a first type in which the diamonds are flattened perpendicularly to their forward direction, and at high speed in at least two other zones of a second type in which the diamonds are flattened in the forward direction. The speed of the chain varies in continuous manner in the portions of the chain situated between the two types of zones, the said bars bearing plate elements which partly overlap to form a horizontal receiving surface of continuous general configuration.

3,709,151

RAILWAY CAR CENTER BEARING

Robert M. Cook, St. Charles, and Charles B. Goldman, Ballwin, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Jan. 7, 1971, Ser. No. 104,638
Int. Cl. B61f 5/14, 5/16, 5/18
U.S. Cl. 105—199 C 10 Claims



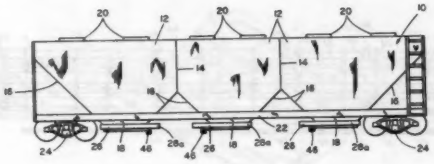
A center plate structure for a railway car having a bowl on the truck bolster to receive a center plate on the car body. A bearing insert for the body center plate is positioned within the bowl in a freely floating relation to the bowl and is movable within the bowl in a generally horizontal relation. The bearing insert has an upper convex surface which mates with a concave lower surface on the body center plate to permit a relative tilting movement between the body center plate and the bearing insert on the truck bolster.

3,709,152

HOPPER CAR GATE LATCHING MECHANISM

Jack E. Gutridge, Dyer, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Dec. 28, 1970, Ser. No. 101,727
Int. Cl. B61d 7/20, 7/26; E05b 65/14
U.S. Cl. 105—253 5 Claims



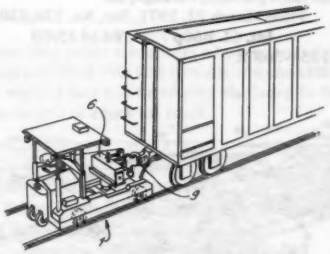
A transverse rotatable locking bar member carried on a hopper gate and having notched semicircular end portions mating in a similarly contoured locking block fixedly positioned alongside the sliding gate. Rotation of a centrally disposed locking bar handle moves the semicircular notched end portion of the locking bar from the locked position within the semicircular cutout in the locking block to permit sliding and opening movement of the hopper door.

3,709,153

CONVERTIBLE RAIL-HIGHWAY TRACTION VEHICLE

William Howard Herscovitch, Bredenbekstrasse 12, Hamburg-Ohlstedt, Germany

Filed May 6, 1970, Ser. No. 35,220
Claims priority, application United Kingdom, May 7, 1969, 23,397/69
Int. Cl. B61c 13/00, 15/04; B61f 9/00
U.S. Cl. 105—26 R 6 Claims

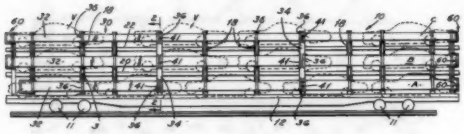


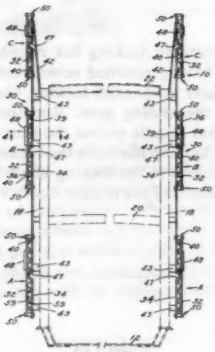
The invention relates to railway tractor engines and in particular to means for transferring part of the weight of a towed car onto the wheels of the tractor engine so as to prevent overturning or derailing and to increase the friction between the wheels and the rails. The invention relates in particular to traction engines with knuckle type couplers.

3,709,154
PROTECTIVE SIDE PANEL INSTALLATION FOR RAIL CARS

Israel D. Peisner, Huntington Woods; Louis K. Deshetler, Allen Park, and Paul C. Augustine, Taylor, all of Mich., assignors to Whitehead & Kales Company, River Rouge, Mich.

Filed Oct. 15, 1970, Ser. No. 81,023
Int. Cl. B60p 3/06; B61d 3/02
U.S. Cl. 105—368 R 13 Claims



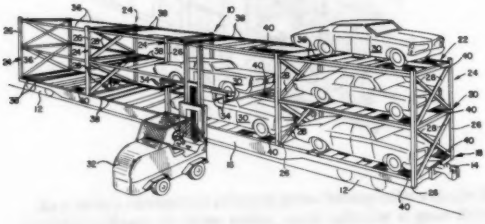


A railroad flat car having siding in the form of panels or sheets at least partially closing the sides of the car. Upright spacer bars are mounted on the flat car, and clamps fastened to the spacer bars secure the panels thereto.

3,709,155
AUTOMOBILE HOLD-DOWN DEVICE

William L. Pringle, Grosse Pointe Shores, Mich., assignor to Pullman Incorporated, Chicago, Ill.

Filed March 22, 1971, Ser. No. 126,820
Int. Cl. B60p 7/08; B61d 45/00
U.S. Cl. 105—368 R 19 Claims

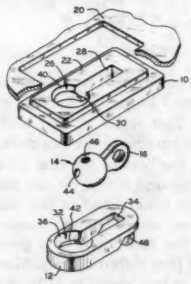


An automobile hold-down device for use on a railway vehicle and having hook members operatively attached to rotating arm members and movable automatically in a vertical direction from a below deck inoperative position upon horizontal movement of an interconnected yoke member and said hook members movable in a transverse direction to locking engagement with the automobile frame in response to operation of a rotating cam means connected with the hook members to securely fastened the automobile during transport. A series of such hold-down devices are locked and unlocked by longitudinally extending cables which are driven by manually actuated drive means.

3,709,156
CARGO SECURING DEVICE

Thomas S. Bowers, Lake Forest, Ill., assignor to A. L. Hansen Manufacturing Co., Gurnee, Ill.

Filed April 15, 1971, Ser. No. 134,198
Int. Cl. B60p 7/08
U.S. Cl. 105—369 A 10 Claims

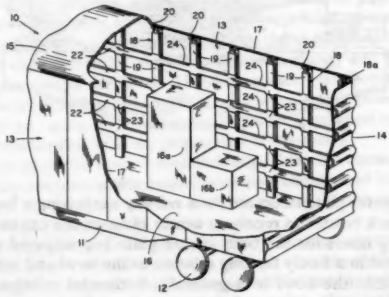


The cargo securing device is welded in an opening in the deck of a vessel with the top thereof flush with the deck and is composed of a pair of members having openings therein cooperating to form a socket in which a spherical shaped member is mounted. The spherical member has a belt attaching eye projecting outwardly from its surface and adapted to move through aligned slots in the members in registry with the socket so that the eye may be moved either above or below the deck. The spherical member is retained within the socket and is universally pivotable with respect thereto so that the eye may be moved to a plurality of positions either above the deck or below the deck.

3,709,157
RAILWAY CAR INTERIOR WALL STRUCTURE

Richard C. Snyder, Michigan City, Ind.; Robert R. Parmenter, Chicago, Ill., and Steve L. Suvada, Michigan City, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Dec. 28, 1970, Ser. No. 101,672
Int. Cl. B61d 17/08
U.S. Cl. 105—409 3 Claims



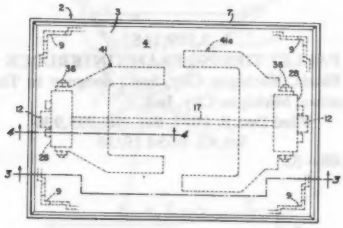
Vertically spaced rail members that extend longitudinally of the railway vehicle across and between the car vertical wall

posts to prevent transported lading such as boxes, or other types of cartons from contacting the vertical wall posts during vehicle impact resulting in damage to the lading. The rail members provide a smooth car interior and include transversely extending flange portions which strengthen the rail members and the railway car side wall structure by forming a channel shaped section between adjacent wall posts.

3,709,158
SERVING TRAY CONSTRUCTION WITH ADJUSTABLE CLAMP MEANS

Mathew Kidd, 21261 Rolling Hills Road, Cupertino, Calif.

Filed March 29, 1971, Ser. No. 128,971
Int. Cl. A47b *23/00*
U.S. Cl. 108—43 **8 Claims**

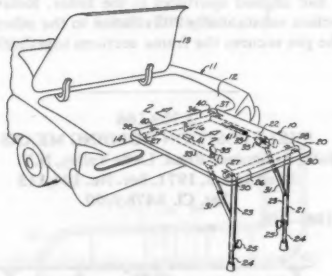


Presented is a serving tray incorporating novel clamp means enabling clamping of the serving tray to a suitable support such as a person's lap or to the arm of a chair.

3,709,159
FOLDING SERVING TABLE

Ira D. Oglesby, Jr., Fort Smith, Ark., assignor to Fort Smith Table and Furniture Co., Fort Smith, Ark.

Filed Jan. 22, 1971, Ser. No. 108,919
Int. Cl. A47b *23/00*
U.S. Cl. 108—44 **6 Claims**

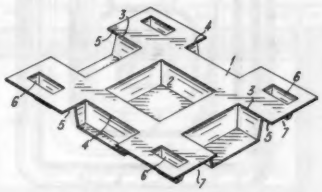


This folding table is for use in conjunction with an automobile trunk and includes a folding leg frame at one end and an adaptor at the other end. The adaptor includes a downwardly projecting lug receivable by the automobile trunk lock socket and the lug is rotatable to a storage position when not in use. A second folding leg frame at the adaptor end of the table allows the table to be used conventionally and the adaptor lug is attached to the leg frame so that when the frame is unfolded for conventional use, the adaptor lug is rotated to a non-use position. The lug is pivotally attached to the crossbar of the leg frame to further facilitate storage.

3,709,160
PALLETS

John Arthur Howard, 2 Audley Close Weston, Somerset, and Gwendolen Alice Sergant, Longacre Walberton Arundel, Sussex, both of England

Filed March 11, 1971, Ser. No. 123,180
Claims priority, application Great Britain, March 18, 1970, 13,079/70
Int. Cl. B65d *19/00*
U.S. Cl. 108—51 **8 Claims**

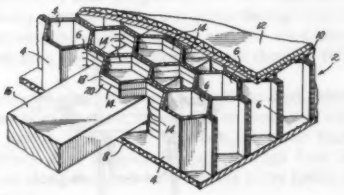


A pallet moulded from plastics material comprises a platform with incut recesses at its edges. The platform may also have box-like dished recesses in spaced positions in its surface. The dished recesses are all of the same height to serve as supporting legs, and are tapered to allow a plurality of pallets to nest on top of one another.

3,709,161
HONEYCOMB PALLET

Robert J. Kauffman, Plymouth, Mich., assignor to Narad, Inc., Wayne, Mich.

Filed April 6, 1971, Ser. No. 131,604
Int. Cl. B65d *19/00*
U.S. Cl. 108—51 **5 Claims**



A load carrying pallet made from a honeycomb slab of sheet material and provided with slits in walls of some cells to define weakened regions that can be readily displaced to form channels for the fingers of a fork lift truck.

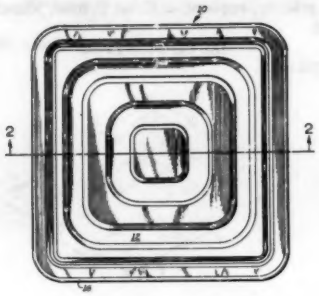
3,709,162
SINGLE SHEET PALLET

Ralph E. Roper, Indianapolis, Ind., assignor to Wallace Expanding Machines, Inc., Indianapolis, Ind.

Filed Dec. 29, 1969, Ser. No. 888,569
Int. Cl. B65d *19/00*
U.S. Cl. 108—51 **3 Claims**

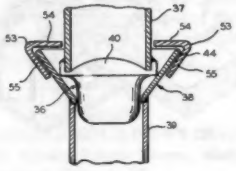
A pallet including an annular leg concentrically formed in the pallet and a coiled edge extending around the entire periphery thereof. The pallet is formed out of sheet metal by repeated draw operations whereby the central portion of the pallet is first formed and then the central configuration is held by tightly gripping dies while the outer portions of the pallet are formed progressively. The outer edge portion of the pallet is coiled around the complete periphery thereof by a die arrangement which captures the coil in a closed container and

retains it as it is being formed. The outer edge portion of the pallet is first formed in the shape of a flange extending perpendicularly of the central portion of the pallet. Recessed dies are then closed about the flange and a set of centrally located



holding dies, which grip the pallet, are moved relative to the recessed dies causing one of the recessed dies to wipe one of the holding dies and causing the outer edge portion of the pallet to be coiled in the closed space between the recessed dies.

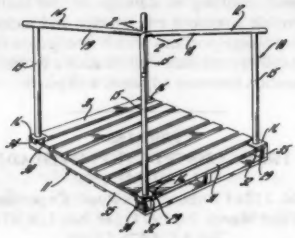
3,709,163
STACKING CONNECTION AND LOCKING DEVICE THEREFOR
Richard W. Smedley, Joliet, and Earl J. Mack, Coal City, both of Ill., assignors to Cerco Corporation, Joliet, Ill.
Filed July 8, 1970, Ser. No. 53,114
Int. Cl. B65d *19/38*
U.S. Cl. 108—53 **19 Claims**



A stacking connection for pallets including a target and plug arrangement. The target is formed to center the plug, and includes a hole through which a portion of the plug may extend to enhance the stacking connection and inhibit separation of the connection when the pallets are subject to forces accidentally encountered. A locking device is provided for the stacking connection to further inhibit vertical separation.

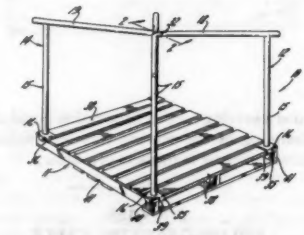
3,709,164
PALLET TIERING FRAME STRUCTURE
Leroy F. Skubic, LaPorte, Ind., assignor to The Paltier Corporation, Michigan City, Ind.
Filed Dec. 8, 1971, Ser. No. 205,929
Int. Cl. B65d *19/38*
U.S. Cl. 108—53 **7 Claims**

A releasable interlock for a pallet tiering frame structure comprising two non-identical sections each with a pair of upright posts connected at their upper ends by V-shaped top members and having pallet engaging feet at their lower ends. The interlock structure involves a pin having diametrical abutments and projecting from the apex of one top member which, when inserted into aligned apertures in the apex of the other



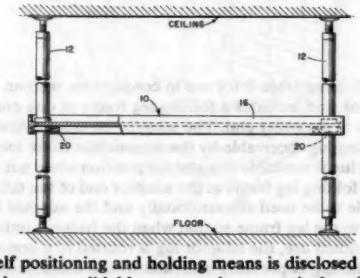
top member and turned substantially 90° about its axis, secures the frame sections together on the pallet.

3,709,165
PALLET TIERING FRAME INTERLOCK
Peter P. Blozis, Michigan City, Ind., assignor to The Paltier Corporation, Michigan City, Ind.
Filed Dec. 8, 1971, Ser. No. 205,930
Int. Cl. B65d *19/38*
U.S. Cl. 108—53 **6 Claims**



A releasable interlock for a pallet tiering frame comprising two non-identical sections each with a pair of upright posts connected at their upper ends by V-shaped top members and having pallet engaging feet at their lower ends. The interlock structure involves a pin having diametrical abutments and projecting from the apex of one top member which engages an apertured locking bracket on the apex of the other top member and aligned apertures in the latter. Rotation of one frame section substantially 90° relative to the other about the axis of the pin secures the frame sections together on the pallet.

3,709,166
SHELF POSITION-HOLDING MEANS
Paul S. Bush, Salamanca Road, Little Valley, N.Y.
Filed Jan. 5, 1971, Ser. No. 104,115
Int. Cl. A47b *9/00*
U.S. Cl. 108—106 **2 Claims**



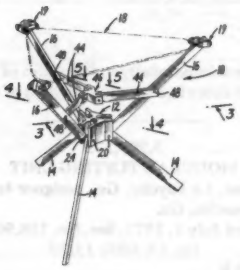
A shelf positioning and holding means is disclosed wherein the shelves are slidably mounted on vertical poles. The

openings thru the shelves for receiving the poles are provided with downwardly extending tines adjacent the poles, which tines are compressed tightly against the poles by specially designed complementary collars.

3,709,167
FOLDING STOOL

Arthur Sprigman, Queens Village, N.Y., assignor to A. L. Doering Mfg. Corp., Bayside, N.Y.

Filed Feb. 25, 1971, Ser. No. 118,769
Int. Cl. A47b 3/00
U.S. Cl. 108—128 8 Claims

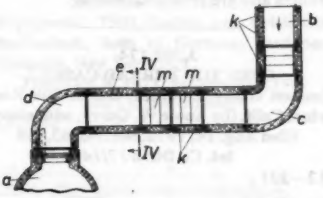


A folding stool with legs and separate seat braces that extend from and are pivotally attached to a hub. When the stool is unfolded, the legs are retained in their normal, load supporting positions by angularly disposed edges on their minor portions,and the seat braces are also retained in their normal, load supporting positions. The legs can be folded to overlap the seat braces so that the stool can be folded the length of the legs or seat braces, whichever are longer.

3,709,168
PROTECTIVE SHELTER INSTALLATION

Gustav Ludwig, Saganer strasse 1, Nurnberg, Germany

Filed Feb. 10, 1970, Ser. No. 10,145
Claims priority, application Germany, Feb. 15, 1969, P 19 07 733.9
Int. Cl. E04h 9/12
U.S. Cl. 109—1 S 7 Claims

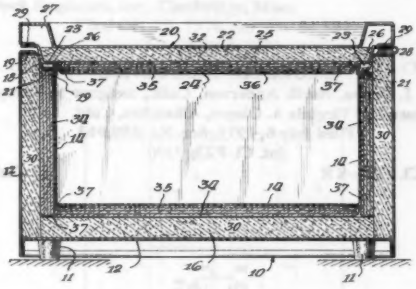


A protective shelter such as a bomb shelter can be entered into or left through an elongate tunnel connected with an enclosed shelter area and including at least two spaced apart angle sections formed by correspondingly curved side walls of the tunnel. The curved tunnel sections serve to prevent the build-up of a destructive pressure head in the tunnel. The walls of the tunnels are constructed of prefabricated concrete blocks joined in situ by suitable screw connections.

3,709,169
FIREPROOF CONTAINER

Edward A. Gauger, Jr., Chicago; Wallace H. Brown, Downers Grove, and William J. Gartner, Schaumberg, all of Ill., assignors to The Babcock & Wilcox Company, New York, N.Y.

Continuation-in-part of Ser. No. 702,307, Feb. 1, 1968, abandoned. This application Jan. 16, 1970, Ser. No. 3,426
Int. Cl. E05g 1/02
U.S. Cl. 109—29 13 Claims



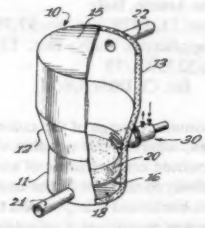
A container for protecting valuable items such as papers from exposure to fire or intense heat comprising an outer frame, an inner container, and a closure means or a lid. Between the outer frame and inner container, and within the lid, there are heat protection means, each comprising an outer portion of a heat resistant material such as ceramic fiber and an inner portion of an absorbent material such as glass paper which is soaked in water and encased in a water-impermeable jacket made of, for example, polyethylene, which is rupturable upon exposure to elevated temperatures. Typically, vents permit steam which is generated in the presence of intense heat in the inner portions of the heat protection means to pass into the interior of the container to further slow any rise in temperature therein by absorbing heat, and the vents also permit steam to slowly pass out of the container through the channel defined between the closure means and the container itself, thereby inhibiting the inward flow of heat through this channel.

In a preferred embodiment, a water-soaked, elongated, fibrous, absorbent material, encased in an elongated water-impermeable jacket, is disposed between the outer frame and inner container at a location subject to high heat transfer rates, such as along the jamb between the outer frame and the inner container.

3,709,170
SLUDGE FEED SYSTEM FOR INCINERATOR

Louis Ralph Van Gelder, Western Springs, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed July 28, 1971, Ser. No. 166,710
Int. Cl. F23g 5/00
U.S. Cl. 110—8 R 14 Claims



Sludge feed system for a reactor having a nozzle, and a conduit communicating with the outside of the reactor and the

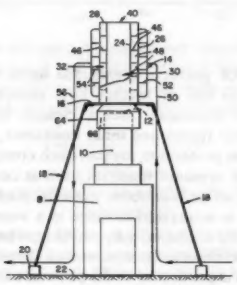
nozzle for feeding sludge to the nozzle under pressure, said nozzle having a mouth in communication with the interior of the reactor for forming the sludge into a thin layer which breaks up in the reactor.

Method of feeding sludge of limited fluidity into a reactor by shaping the sludge into a soft layer which is much wider than thick, and feeding the layer directly into the reactor.

3,709,171
SMOKE CONTROL DEVICE

John J. Barbu, North Anderson, Calif., assignor to Larry F. Olesen and Virginia A. Olesen, Alhambra, Calif.

Filed July 6, 1971, Ser. No. 159,913
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 R **23 Claims**



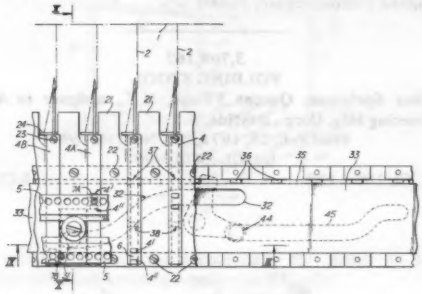
After burner for burning combustible particles in smoke and exhaust gases from stationary installations. A heater is disposed adjacent an intake opening of a water cooled combustion chamber and brings the smoke to its combustion temperature. Particulate matter is removed from the smoke by filters before the clean, non-polluting gas is discharged to the atmosphere. Surfaces of the combustion chamber contacted by smoke or cooling water are coated with Teflon to inhibit substantially all accumulation of particulate matter on such surfaces and prevent clogging of the device. The chamber can be mounted on top of a smoke discharging stack or device or it can be placed on the ground and provided with suitable conduits and blowers for passing the smoke to and through the combustion chamber. Openings are provided to supply the necessary additional combustion air to the combustion chamber.

3,709,172
AUTOMATIC EMBROIDERY MACHINE

Ercole Comerio, Busto Arsizio, Italy, assignor to Metalmeccanica S.p.A., Busto Arsizio, Italy

Filed Dec. 11, 1970, Ser. No. 97,287
Claims priority, application Italy, Dec. 13, 1969, 25751 A/69; Nov. 27, 1970, 32339 A/70
Int. Cl. D05c *5/00*
U.S. Cl. 112—84 **20 Claims**

Device for the automatic change of the color and/or ratio in embroidery machines, wherein the needles, each carrying a given thread, are mounted on the frame of needles by means of slides sliding parallelly to the axis of the needles and movable selectively from a backward idle position to a forward active position; the device comprises a selection bar arranged transversely to the slides of the needles and movable according to two substantially orthogonal directions, on one side perpendicularly to the slides of the needles, to select the slides or rather the needles through engagement of selected hook means of the bar with corresponding hook means of the slides,

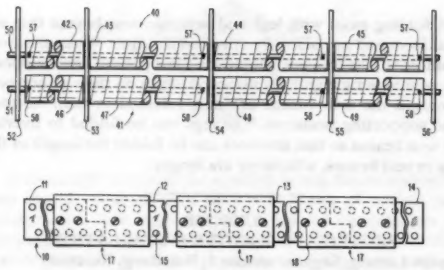


and on the other side parallelly to the slides of the needles, to shift the selected slides in a forward position of work.

3,709,173
MODULAR TUFTING UNIT

Mervin D. Greene, La Fayette, Ga., assignor to Jorges Carpet Mills, Inc., Rossville, Ga.

Filed July 1, 1971, Ser. No. 158,903
Int. Cl. D05c *15/20*
U.S. Cl. 112—79 R **9 Claims**

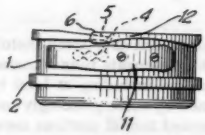


A modular tufting unit has a needle bar formed of a plurality of sections or modules with each section being capable of being rendered ineffective. The modular tufting unit has its yarn feed rollers divided into sections or modules. Each of the sections of each of the yarn feed rollers is the same length as the section of the needle bar with which it is aligned in the direction of movement of the yarn. When one of the needle bar sections is rendered inactive, the aligned sections of the yarn feed rollers also are rendered inactive.

3,709,174
OPEN TOP THREAD CASES

Thomas Emmett Garry, deceased, late of 908 Roxbury Rd., San Marino, Calif. (by Annie W. Garry, administratrix)

Filed Aug. 14, 1970, Ser. No. 63,869
Int. Cl. D05b *57/14*
U.S. Cl. 112—231 **6 Claims**



A sewing machine thread case acts as a container for the bobbin which holds the bottom thread on a lock-stitch sewing

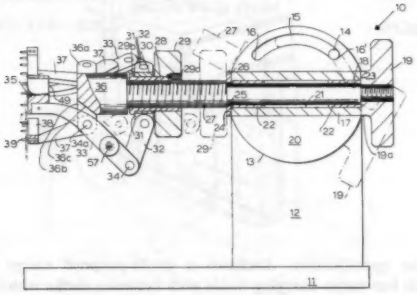
machine. The thread case is set within a loop taker which takes the thread from the needle and casts it around a thread case having a limited movement upon its own axis for the purpose of making a lock-stitch.

3,709,175

FABRICATING EQUIPMENT FOR TISSUE TYPE HEART VALVE

William Sterling Edwards, Albuquerque, N. Mex.; Paul Kahn, San Francisco, and Samuel H. Goodenough, Oakland, both of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed July 26, 1971, Ser. No. 166,214
Int. Cl. D05b *1/00*; A61f *1/00*
U.S. Cl. 112—262 **12 Claims**



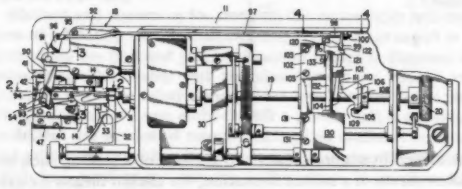
A device for making a replacement heart valve having a plurality of cusps. The combination includes a mold means for forming a tissue, suitably an animal tissue and particularly a homologous tissue, into cusp form. A clamping means causes the mold means to form the tissue into a cusp shape, and a tissue-engaging means, such as a trim guide, holds such tissue in place, advantageously in unstretched condition, to facilitate suturing and trimming to desired, predetermined size. Such tissue-engaging means may be a plurality of pins adapted to pierce the tissue and hold it in place. The mold means, clamping means, and tissue-engaging means are all rotatable and are movable arcuately with respect to the long axis of the combination or assembly to enable easy access to the workpiece or valve. A valve stent is brought into engagement with the mold means, clamp means, and tissue-engaging means, so that the tissue can easily be sutured to the stent with ready access thereto and in a rapid operation which can be carried out by one operator.

3,709,176

UNDERBED THREAD TRIMMING MECHANISM FOR SEWING MACHINES

Reinhold Papajewski, 7501 Buchig, and Erich Gillessen, 75 Karlsruhe-Durlach, both of Germany, assignors to The Singer Company, New York, N.Y.

Filed Oct. 8, 1971, Ser. No. 187,710
Int. Cl. D05b *65/00*
U.S. Cl. 112—252 **5 Claims**



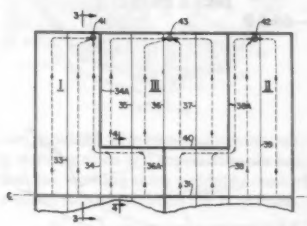
An underbed thread trimmer for both the needle and bobbin threads of a lockstitch sewing machine is disclosed in which a thread pick-up finger is moved across the path of the threads to be severed, and in which during return of the thread pick-up finger a cam associated therewith effects the opening and closing of a scissor type thread cutter.

3,709,177

DRY DOCK PONTOON PROVIDING IMPROVED STABILITY

Paul S. Crandall, Concord, Mass., assignor to Crandall Dry Dock Engineers, Inc., Cambridge, Mass.

Filed Oct. 28, 1970, Ser. No. 84,582
Int. Cl. B63c *1/02*
U.S. Cl. 114—46 **4 Claims**



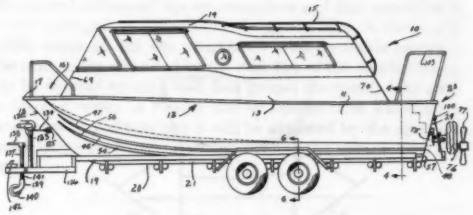
In the multi-section dry dock construction disclosed herein, the pontoon portion of each section is subdivided by watertight bulkheads in a pattern which improves lateral stability and provides flexibility in longitudinal loading capability while retaining a basically easily pumped and drained arrangement. In one embodiment, each side of the pontoon is divided into three watertight compartments, two of which are L-shaped and are arranged in complementary fashion with the third compartment enclosed therebetween. The bases of the L-shaped compartments are adjacent the center line of the pontoon so that all three compartments extend under a respective one of the dry dock wings and may therefore be easily pumped.

3,709,178

BOAT AND TRAILER

Herbert M. Piker, and Otis C. Borum, both of Jacksonville, Fla., assignors to Farenwald Enterprises, Inc., Lancaster, Pa.

Division of Ser. No. 51,855, July 2, 1970. This application April 28, 1971, Ser. No. 138,151
Int. Cl. B63b *1/18*
U.S. Cl. 114—56 **4 Claims**



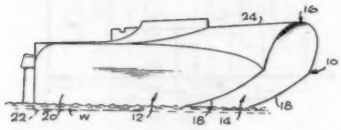
The boat as herein disclosed is primarily intended to be utilized with a trailer designed, particularly, to receive cooperating means on the boat hull whereby the trailer and boat, particularly, the boat hull, become a unit in using same as a movable house or home, and as a houseboat when separated from the trailer and on the water, such as a lake, river, or other body of water. Specifically, the cooperation of the trailer and house or home is accomplished by cooperating means on the

trailer, that is, the longitudinal members or rails on which the boat is carried and grooves or slots formed in the hull of the boat in which the said longitudinal trailer members or rails project for thereby stabilizing both the boat when in the water and the mobile house or home when on land. The said houseboat or home is provided with a set of retractable steps for use in the water and on the land for boarding or dismounting from the same.

3,709,179
HIGH SPEED BOAT

Peter R. Payne, Silver Spring, Md., assignor to Wyle Laboratories, El Segundo, Calif.

Filed July 6, 1970, Ser. No. 52,543
Int. Cl. B63b *1/20*
U.S. Cl. 114—66.5 P **12 Claims**

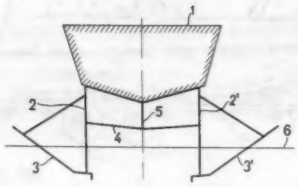


A boat for operating at high speeds even in water having waves of moderate to large height, comprising a pair of laterally spaced hull sections connected by a body. The rear portion of each hull section has a planing surface, all of the planing surfaces normally being submerged even during high speed travel. The front portion of each hull section has a narrow width and sharp entry angle for cutting into waves instead of riding over them. The body that connects the hull sections normally extends at a large height above the water surface, and it includes a front body portion at the bow to assure that the boat will ride over very large waves.

3,709,180
HYDROFOIL CRAFT

Lech Kobylinski, Chlopska 34D/28, Gdansk-Oliwa; Mieczyslaw Krezelewski, Stolarska 4A/4, Gdansk; Edmund Brzoska, Lumumby 32E/13, Gdansk-Oliwa, and Witold Krenicki, Dzierzynskiego 3/15, Gdynia, all of Poland

Filed Aug. 27, 1970, Ser. No. 67,453
Claims priority, application Poland, Sept. 9, 1969, P 135792
Int. Cl. B63b *1/20*
U.S. Cl. 114—66.5 H **4 Claims**

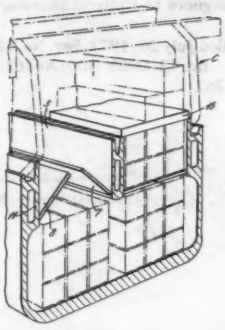


A hydrofoil craft having a pair of laterally spaced bow supporting planes carried by downwardly extending supports has a transverse roll stabilizer extending between the supports and structurally connected to them, the stabilizer being above the in-flight calm water line and above the space between the bow supporting planes.

3,709,181
CARGO VESSELS

John Paul Papanicolaou, Athens, Greece, and Telemachus Nicolas Galati, London, England, assignors to Marine and Industrial Developments Limited, Piraeus, Greece

Filed Dec. 10, 1970, Ser. No. 97,042
Claims priority, application Great Britain, Dec. 10, 1969, 60,295/69
Int. Cl. B63b *25/00*
U.S. Cl. 114—72 **4 Claims**



The specification discloses a multi-purpose cargo ship which has cargo-carrying holds with between decks which are fully collapsable. The between decks are composed of panels which are hinged for folding into vertical planes against the boundary walls of the hatchways. When the between decks are in use they separate the holds into upper and lower compartments for carrying different types of cargo. When the between decks are collapsed the vessel can be used as a full bulk cargo carrier and is self-trimming. The upper hold compartments lie abreast of a longitudinal strength member which is preferably a hollow structure providing a tunnel or passageway for personnel.

3,709,182
ANCHOR MEANS AND METHOD OF INSTALLING THE SAME

Edward E. Horton, Portuguese Bend, Calif., assignor to Deep Oil Technology, Inc., Long Beach, Calif.

Filed Feb. 24, 1970, Ser. No. 13,536
Int. Cl. B63b *21/24*, *21/50*
U.S. Cl. 114—206 R **5 Claims**

A drilled-in anchor means and method of installing such an anchor means in a subsea formation, the anchor means including prestressed cable and casing means imbedded in cement which fills an anchor hole in the subsea formation. A subsurface buoy at a selected distance above the surface of the sub-

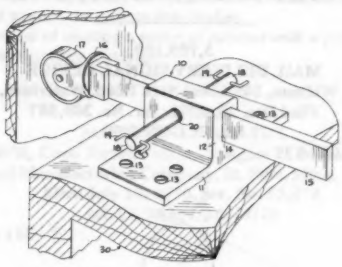
sea formation provides a connection to a mooring line which may extend from a platform means or other floatable structure. In the method of installing such an anchor means after a drill hole has been made by using a drill casing, the casing is raised a selected distance and then is subjected to stress by a tension cable cooperable therewith, and then the casing and cable means is lowered into the hole. The casing means and hole are then filled with a cement slurry whereby the drill casing and cable are protected against corrosive action of the water.

3,709,183

COMBINATION CLEAT AND BUMPER

Irving Mace, 1221 Kilby Terrace, Anniston, Ala.

Filed Jan. 27, 1971, Ser. No. 110,026
Int. Cl. B63b *21/04*
U.S. Cl. 114—220 **4 Claims**



A combination bumper and tie-up cleat for use on boats and other water vehicles including a bracket means adapted to be secured to a surface portion of a boat in a predetermined location. The bracket means includes a first opening for slidably mounting a bumper element, with the bumper element including a caster roller bumper means located on an outwardly extending end thereof. A pair of adjustable locking screw means is provided for adjustment within complementary openings on the bracket means for securing the bumper means in a selectively set position to space the caster roller at a selected distance outward from the side of the boat. The bracket means is detailed in design to readily receive a tie-up line for securing a boat in a docked position when the bumper means is removed. The locking screw means is detailed in design for maintaining the tie-up line in position on the bracket means.

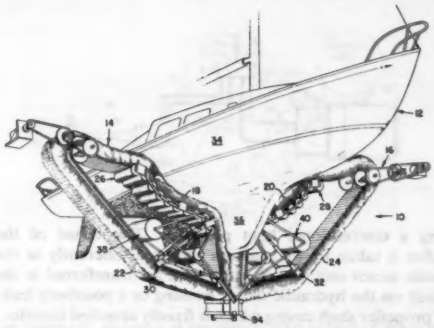
3,709,184

METHOD AND APPARATUS FOR CLEANING VESSELS AFLOAT

Henry J. Laney, 5950 LaSalle Avenue, Oakland, Calif.

Continuation-in-part of Ser. No. 748,532, July 29, 1968, Pat. No. 3,541,988. This application Sept. 28, 1970, Ser. No. 75,961
Int. Cl. B60s *3/00*
U.S. Cl. 114—222 **8 Claims**

Method and apparatus for cleaning the underwater hull surface of a floating vessel. Hull cleaning means is arranged in a path along the hull and yieldable carrier means is disposed in supporting relationship with the cleaning means. Means are provided to create relative movement between the vessel and cleaning means. In one embodiment a pincer unit is provided to deflect the tensioned return reach of an endless conveyor and utilize the resulting reaction force for urging the working reach into conformity with the hull surface. In another embodiment vertically spaced actuator arms yieldably urge rotary or belt-type cleaning means into conformity with the hull. In another embodiment flexible, buoyant belts of cleaning elements are oscillated in contact with the hull. In another embodiment a plurality of rotating float elements with peripheral cleaning bristles are arranged in series along a path adjacent the hull surface. In another embodiment flexible, inflatable



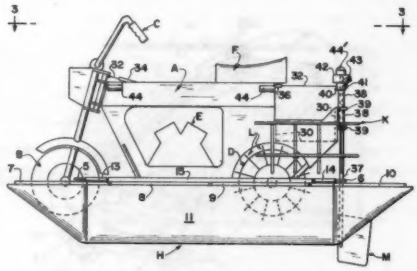
containers are provided with cleaning means on their inwardly confronting working sides and support means holding the containers so that the working sides yieldably conform to the hull surface of a vessel moved between the containers.

3,709,185

AMPHIBIOUS MOTOR BIKE

Anthony Hennel, 645 Eldorado, Apt. 109, Oakland, Calif.

Filed Aug. 19, 1971, Ser. No. 173,179
Int. Cl. B63h *1/04, 19/00*
U.S. Cl. 115—0.5 **5 Claims**



An amphibious motor bike in which collapsible pontoons may be inflated and removably secured to the sides of the motor bike for supporting it on a body of water and at a position where the water level will be not higher than the lower one-third portion of the rear wheel. The pontoons are sectionalized and can be removed from the motor bike sides and deflated and collapsed like an accordion and then mounted in carriers arranged at the sides of the motor bike. A linear and flexible water paddle has articulated sections which permit it to be removably mounted on the rear tire of the motor bike so as to be rotated thereby and thus propel the motor bike over the body of water. A rudder can be moved from inoperative into operative position and it will be actuated by the operator manipulating the handle bars for steering the vehicle over the water.

3,709,186

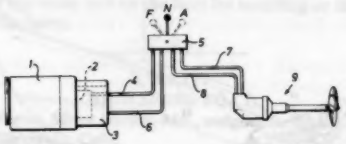
PROPELLING MEANS FOR MOTOR BOATS AND AUXILIARY SAILING YACHTS

Tord Christer Gotmalm, Platmyntsgaten 19, Goteborg V, Sweden

Filed Jan. 21, 1971, Ser. No. 108,331
Int. Cl. B63h *23/26*
U.S. Cl. 115—34 A **12 Claims**

The present invention relates to propelling means for motor boats and especially auxiliary sailing yachts. More specifically,

the invention relates to improved propelling means comprising a combustion engine driving a hydraulic oil pump, the pressurized oil from the said hydraulic pump being fed over a valve mechanism to a hydraulic motor, the shaft of which is

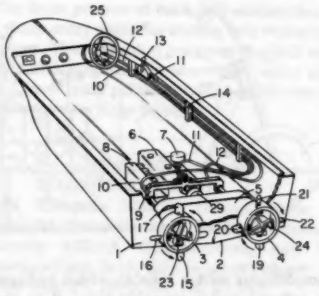


bearing a conventional boat propeller. The thrust of the propeller is taken up by bearings arranged inherently in the hydraulic motor unit; thrust and torque are transferred to the boat hull via the hydraulic motor housing or a positively leak-proof propeller shaft casing which is fixedly attached thereto.

3,709,187
PROPULSION AND CONTROL SYSTEM FOR MOTORBOAT

Alex A. Marco, 2556 N. Strathmore Avenue, Rosemead, Calif., and Dennis L. Wirth, 624 North Reese Pl., Burbank, Calif., assignors to said Marco and Wirth, part interest to each

Filed July 22, 1970, Ser. No. 57,296
Int. Cl. B63h *3/04*
U.S. Cl. 115—35 **5 Claims**



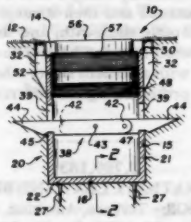
A combination motor boat propulsion and steering control system is shown which is particularly adapted to planing hull, high speed boats. The invented combination will eliminate the need for a rudder in such craft by providing dual variable pitch propellers, differentially pitch controlled for steering, and provides for water contact only up to the hubs of counter-rotating propellers, thereby minimizing drag. Forward-reverse control and optimized speed control (while maintaining high power transfer efficiency) are effected by superimposed separate control of propeller pitches together in the same sense.

3,709,188
GROUND MARKER DEVICE

Robert B. Coupar, 4447 Narvaez Crescent, Victoria, British Columbia, Canada

Filed Feb. 1, 1971, Ser. No. 111,522
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 R **5 Claims**

A marker device having a casing which is inserted into a hole drilled into the surface of the ground. Hinged arms are unfolded and extended through slots in the casing to secure the device against withdrawal from the hole. A suitably colored plug may be fitted into the upper end of the casing to be visible above the surface. A number of such devices placed

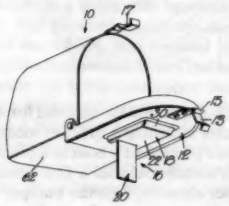


in a row at suitably spaced intervals define a permanently marked line appearing either at or near the level of the ground surface or projecting thereabove. The device is readily converted for use as an anchoring means for a post or the like.

3,709,189
MAIL DELIVERY SIGNAL DEVICE

Ernest G. Widham, 145 Great Neck Road, Waterford, Conn.

Filed Dec. 20, 1971, Ser. No. 209,587
Int. Cl. G08c *5/00*
U.S. Cl. 116—132 **3 Claims**



Mail delivery signal device having on a bottom-hinged lid on a mailbox a casing with a bottom slot and a ledge near the top, and a signal plate having at the top a rearward flange and opposite side ears, and being slidable in the casing and projecting through the bottom slot, with the plate being in non-signalling position resting with its top flange on the ledge in closed vertical lid position and, on opening the lid, sliding off the ledge and gravitating to signalling position, and there being in the casing at the top a cam formation which on manual inward shove of the plate from signalling position cooperates with the top of the plate in camming the same with its flange into overlap with the ledge so as to come to rest on the latter on releasing the plate.

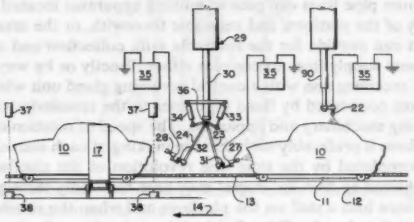
3,709,190
COATING APPARATUS

Horst Von Gottberg; Gerd Schaefer, and Guenter Joerns, all of Heusenstamm near, Frankfurt, Germany, assignors to Ransburg GmbH, Heusenstamm near Frankfurt, Germany

Filed June 11, 1970, Ser. No. 45,444
Claims priority, application Germany, Feb. 14, 1970, P 20 06 878.4
Int. Cl. B05c *11/00*
U.S. Cl. 118—2 **6 Claims**

A coating apparatus including a programmed, movable member carrying coating means dispensing particles of a protective or decorative coating material toward the irregular surface contours of the front and the rear of automobile bodies. The programmed member displaces the coating member in a vertical direction across the irregular surface contours of the

automobile bodies, maintains a substantially uniform distance between the coating means and the plane of the irregular surface contours of the automobile body to be coated and aligns the axis of the coating means with respect to the plane of the irregular surface contours of the automobile bodies so as to be



substantially perpendicular with such plane of the automobile bodies when dispensing the protective or decorative coating material toward the automobile bodies.

A method of coating a series of articles with a protective or decorative coating material.

3,709,191

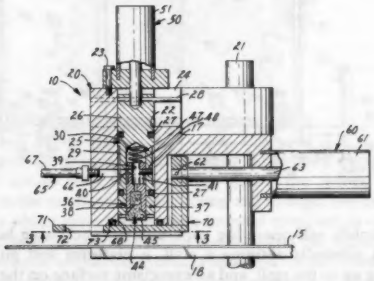
MARKING APPARATUS

Eugen Will, Coon Rapids, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 16, 1970, Ser. No. 55,478

Int. Cl. B05c *1/16, 11/16*

U.S. Cl. 118—8 **8 Claims**



Apparatus comprising a marking apparatus including an extendable-retractable marking means for placing a mark on a moving web and a movable shutter means for sealing the retracted marking means from atmospheric air about the marking apparatus. The frame is rotatable to permit variance in the width of the mark placed on the web.

3,709,192

COATING CONTROL SYSTEM

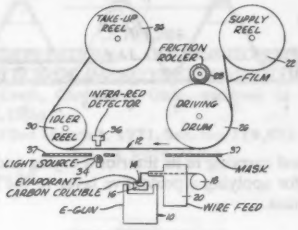
Quinn S. Anderson, Chatsworth; Berton P. Levin, Santa Monica, and Jackie D. Thomson, Los Angeles, all of Calif., assignors to The Sierracin Corporation, Sylmar, Calif.

Filed June 1, 1970, Ser. No. 41,792

Int. Cl. B05b *15/00*; **C23c** *13/08*

U.S. Cl. 118—8 **11 Claims**

There is disclosed herein a system for controlling the resistivity of a metal which is deposited on a moving film substrate. An electron beam gun is positioned adjacent the moving film substrate for providing the metal coating on the substrate. The resistivity of the coating is continuously monitored by detecting electromagnetic radiation, such as infrared, emanant from the coating for providing an output signal which is a function of the resistivity. This signal is applied to a comparator network and compared to predetermined reference levels for correcting long term resistivity drifts as well as short term,



or transient, changes in resistivity. The output of the comparator network is connected to the electron beam gun to control the evaporation rate thereof and to thus control resistivity of the coating.

3,709,193

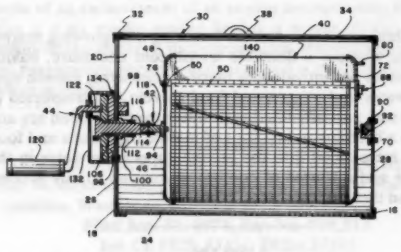
BREADING MACHINE

George A. Moore, 843 N. Dellrose, Wichita, Kans.

Filed Oct. 30, 1970, Ser. No. 85,464

Int. Cl. A23g *3/26*

U.S. Cl. 118—19 **20 Claims**



A machine for breading pieces of food wherein the latter is disposed in a closable, perforate cylindrical body that is rotated about its horizontal axis in a housing containing breading. The body has an internal vane for tumbling the food and external ribs for agitating and elevating breading about the body. The machine includes an accessory perforate basket mountable within the body for removal of lumps from breading. A housing cover is provided that serves as a worktable when the cover is opened.

3,709,194

APPARATUS FOR TREATING CONTINUOUS SURFACES

Paul Hammelmann, Zum Sundern 17, Oelde/Westfalen, Germany

Division of Ser. No. 828,428, May 19, 1969, Pat. No. 3,627,562. This application Nov. 2, 1970, Ser. No. 86,051

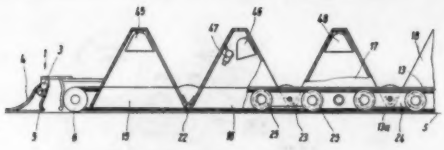
Claims priority, application Germany, May 20, 1968, P 17 56 431.7

Int. Cl. B05c *5/00, 9/08*

U.S. Cl. 118—50.1 **19 Claims**

A continuous surface is treated by advancing over it an apparatus provided at its leading end with a cleaning device and

downstream of the cleaning device with one or more containers which are evacuated and each have an open side facing the just cleaned surface portion in sealing engagement



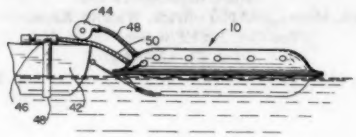
therewith and carrying in its interior a drying and/or applicator device for applying a protective layer to the just cleaned surface portion.

3,709,195

METHOD FOR HATCHING AND GROWING MARINE ORGANISMS

Durbin C. Tabb, Miami, Fla., assignor to Research Corporation, New York, N.Y.

Filed July 30, 1970, Ser. No. 59,508
Int. Cl. A01k *61/00*
U.S. Cl. 119—2 **4 Claims**



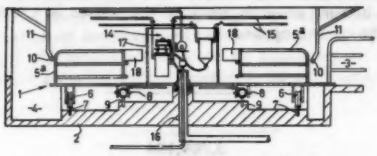
A method and apparatus for hatching and growing marine organisms wherein a floatable translucent enclosure, having input devices for introducing marine organisms, growth supporting water and oxygen and food therein, is transported to the open sea, partially filled with water from the open sea and towed to a berthing point. Eggs of marine organisms and food are then introduced into the growth supporting water in the enclosure and a source of continuous oxygen supply is communicated thereto.

3,709,196

ANIMAL MILKING AND/OR TREATMENT APPARATUS

Mervyn Lance Hicks, Taranaki, New Zealand, assignor to Turn-Styles Limited, Stratford, New Zealand

Filed Jan. 29, 1971, Ser. No. 110,822
Int. Cl. A01j *05/00*
U.S. Cl. 119—14.04 **14 Claims**



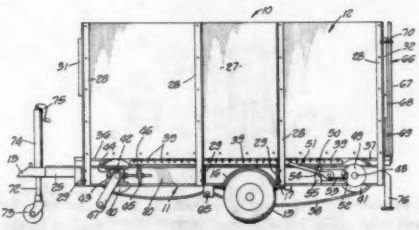
Apparatus particularly intended for use in milking animals and including a horizontal circular platform which is mounted for rotation about a central vertical axis and is arranged to be driven either intermittently or at a slow rate by any suitable prime mover means. The platform has its peripheral part divided into a plurality of animal receiving stalls disposed generally radially, or at a slight angle to the radial line, opening to the periphery of the platform and directed inwardly thereof so that the animals hind quarters are at said periphery to be accessible to an operator outside the platform. In the preferred construction and application of the invention as milking apparatus, each stall is provided with a milking claw and cup assembly connecting with milk collection pipe lines and air or vacuum pipe lines fixed relative to the platform and rotatable with such platform. The milk collection and air or vacuum pipe lines can pass to milking apparatus located centrally of the platform and rotatable therewith, or the arrangement can provide for the rotatable milk collection and air or vacuum supply lines to connect either directly or by way of a milk receiving can with a central revolving gland unit which is in turn connected by fixed pipe lines to the remainder of the milking machinery and apparatus. The speed of rotation of the platform is preferably such that the milking of each animal will be completed by the time one revolution of the platform is completed so that an animal may pass forwardly through an entrance into a stall on the platform and when the revolution is completed and milking finished the animal may back out of the stall off the platform and through an exit adjacent the entrance.

3,709,197

EXERCISING APPARATUS FOR HORSES

Corliss Champion Moseley, 1636 Summit Ridge Drive, Beverly Hills, Calif.

Filed Jan. 7, 1971, Ser. No. 104,679
Int. Cl. A01k *13/00*
U.S. Cl. 119—29 **11 Claims**



A mobile self-operating apparatus for exercising horses includes sidewalls defining a stall, a platform and guidewalls leading up to the stall, and an exercising surface on the floor of the stall. The stall is adapted to confine a horse within a limited area during an exercising period, the platform and guidewalls are collapsible to avoid interference with the travel of the apparatus, and the exercising surface is adapted to walk a horse within the stall at a predetermined uniform rate. The exercising surface is also adjustable to vary the walking rate of a horse and means are provided to prevent movement of the exercising surface when a horse is entering or leaving the stall and to initiate movement of the exercising surface at the beginning of an exercising period.

3,709,198

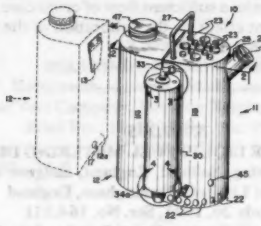
LIQUID HEATER AND STORAGE MEANS

Garold H. Williams, 43 West 100 South, Smithfield, Utah

Filed July 22, 1971, Ser. No. 165,015
Int. Cl. F22b *9/02*
U.S. Cl. 122—14 **5 Claims**

A portable liquid container and heater unit that will conveniently and quickly provide heated liquid. The unit combines a heater housing assembly in which liquid is heated and a detachable liquid storage reservoir. A gas burner assembly uses fuel supplied from a pressurized gas cylinder to generate heat that is passed through tubes extending through a reser-

voir in the heater housing. A handle is provided to carry the unit, and the unit is lightweight, compact and made rugged so



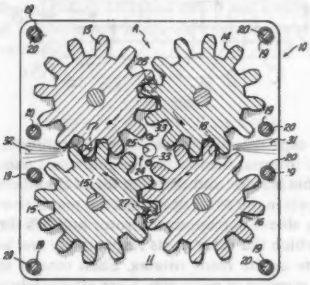
that it can be carried without damage in the storage compartment of a snowmobile or the like.

3,709,199

ROTARY INTERNAL COMBUSTION ENGINE

John William Molyneaux, 2010 Erskine Avenue, Silver Spring, Md.

Filed Jan. 21, 1971, Ser. No. 108,393
Int. Cl. F02b *53/00*
U.S. Cl. 123—8.47 **6 Claims**



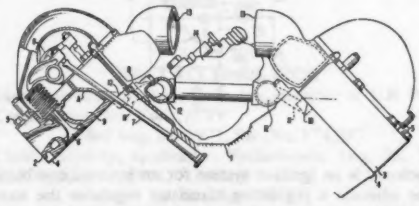
A rotary internal combustion engine is provided employing external rotors with inter-meshing gears, the rotors being opened to the atmosphere for cooling and to expel the exploding gases which drive the gears by internal combustion so that combustion is completed outside the engine in the presence of air to consume unburned hydrocarbons and carbon monoxide in the manner of ordinary external combustion.

3,709,200

COOLING WATER CONDUIT SYSTEM IN INTERNAL COMBUSTION ENGINES

Josef Reisacher, Fellbach (Wurtt.), Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed April 25, 1969, Ser. No. 819,262
Claims priority, application Germany, April 27, 1968, P 17 51 261.7
Int. Cl. F02f *11/38*; **F02b** *75/20*
U.S. Cl. 123—41.82 **9 Claims**



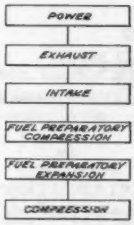
A cooling water conduit system for an internal combustion engine especially for V-type engines in which several cylinder heads are provided for each cylinder row, that contain cooling water discharge apertures at the bottom surface; the cooling water discharge apertures are connected with common collecting lines by way of channels accommodated in the crankcase of the engine.

3,709,201

LOW EMISSION INTERNAL COMBUSTION ENGINE AND METHOD OF IMPROVING COMBUSTION

Harvey A. Cook, Cleveland, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed March 1, 1971, Ser. No. 119,532
Int. Cl. F02b *75/02*
U.S. Cl. 123—64 **4 Claims**



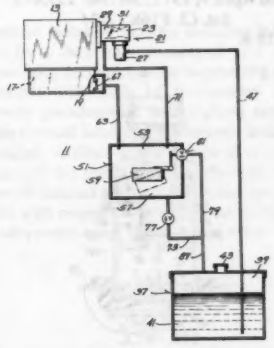
A method for improving the combustion of an internal combustion engine and an internal combustion engine having a low exhaust emission characterized by subjecting the compressed air-fuel mixture to an expansion and second compression step prior to ignition to produce the power stroke. An example of an embodiment of an engine incorporating these features is a six stroke engine having a power stroke, exhaust stroke, intake stroke, a fuel preparation compression stroke, a fuel preparation expansion stroke, and a compression stroke ending in ignition.

3,709,202

CRANKCASE DRAININGS RECYCLING SYSTEM

Peter W. Brown, Zion, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jan. 21, 1971, Ser. No. 108,513
Int. Cl. F02b *33/04*; **F02m** *37/00*
U.S. Cl. 123—73 R **14 Claims**



Disclosed herein is a fuel supply system for a two-stroke engine including a crankcase and a fuel feeding means, said system comprising a fuel tank communicating with the fuel feeding means and including a filler cap having means for sealing the interior of the fuel tank from the atmosphere, and means including a drainage tank communicating through one-way check valves with the fuel tank and the crankcase for con-

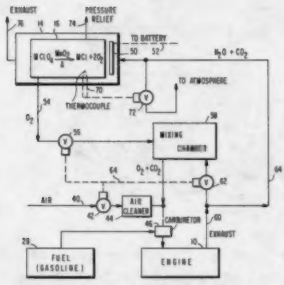
ducting drainings from the crankcase to the fuel tank, for preventing escape of fuel vapor from the fuel tank when the engine is not operating, and for venting of excessive vapor pressure in the fuel tank to the fuel feeding means when the engine is operating.

3,709,203

ANTI-POLLUTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Edward J. Cettin, Ventura; Jimmy P. Pappas, Camarillo, and Sam E. Lager, Somis, all of Calif., assignors to Thermo-Chem Systems, Inc., Wilmington, Del.

Filed July 16, 1971, Ser. No. 163,245
Int. Cl. F02m *25/06*
U.S. Cl. 123—119 A **15 Claims**



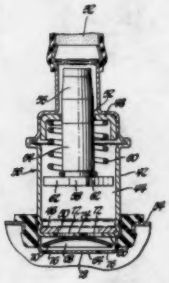
A system is presented for use with any internal combustion engine to eliminate carbon monoxide, hydrocarbons and nitrogen oxides from the engine exhaust. The system is substantially closed, eliminating the use of ambient air for combustion of the fuel, and in place thereof utilizes oxygen generated by the thermal decomposition of an alkali metal perchlorate salt in the presence of a catalyst. Heat for the generation of oxygen is provided by the exhaust from the engine manifold. The exhaust and oxygen are then mixed in proportions of 4:1, and the mixture blended with the fuel in the carburetor for combustion in the engine.

3,709,204

CRANKCASE VENTILATION

Harold W. Noponen, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed April 9, 1971, Ser. No. 132,673
Int. Cl. F16k *17/04*
U.S. Cl. 123—119 B **4 Claims**



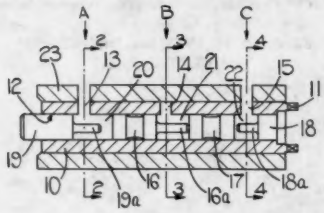
An internal combustion engine crankcase ventilation system includes a flow control valve in a line connecting the crankcase with the engine induction system so as to control the flow of crankcase vapors to maintain a proper mixture in the inlet charge. In preferred form, a thermostatic disc valve is provided at one end of the flow control valve to shut off the flow of crankcase vapors under cold engine starting and warmup conditions. When the thermostatic disc is heated to a predetermined point by engine operation, it snaps open to a position which permits a sufficient flow of crankcase vapors to avoid any significant effect on the calibration of the flow control valve with which it is used.

3,709,205

SHUTTLE TYPE LIQUID FUEL METERING DEVICE

Eric William Downing, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 20, 1971, Ser. No. 164,311
Claims priority, application Great Britain, July 22, 1970, 35,415/70
Int. Cl. F02m *39/00*; **F02b** *3/00*
U.S. Cl. 123—139 AM **4 Claims**



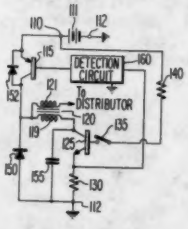
A shuttle-type metering device for controlling a liquid fuel supply to an internal combustion engine has a pair of shuttles slidable within a rotor and defining three chambers in the rotor, three ports in the rotor open into the respective chambers. A stationary sleeve surrounds the rotor and has three rows of ports with which the rotor ports respectively and successively communicate as the rotor rotates. Each row of sleeve ports has an even number of ports which are alternately arranged as inlet and outlet ports. The porting arrangement is arranged to supply fuel to an engine having an odd number of cylinders.

3,709,206

REGULATED IGNITION SYSTEM

Richard Stanley Myers, Branchburg, N.J., assignor to RCA Corporation

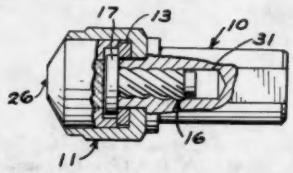
Filed July 8, 1971, Ser. No. 160,808
Int. Cl. F02p *3/02*
U.S. Cl. 123—148 E **11 Claims**



Disclosed is an ignition system for an internal combustion engine wherein a regulating transistor regulates the energy stored in the primary winding of an ignition coil. A spark control transistor is responsive to the operation of the engine to cause the energy stored in the primary winding to induce a

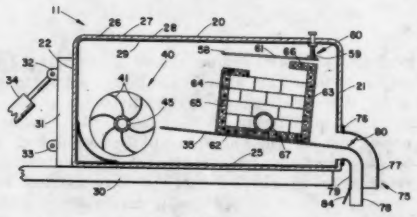
high voltage in the secondary winding of the coil which in turn is used to provide a high energy spark to the spark plugs via the distributor.

3,709,207
DIAMOND DRESSING TOOL
Arthur T. Kohlstrunk, Livonia, Mich., assignor to Abrasive Diamond Tool Company, Madison Heights, Mich.
Filed Dec. 18, 1970, Ser. No. 99,419
Int. Cl. B24b *53/12*
U.S. Cl. 125—11 N 4 Claims



A diamond dressing tool comprising a body having a shank, an insert holder mounted on said body and a diamond insert press fitted into said insert holder. The insert holder and body have radially extending surfaces which are engaged with one another and a drive screw holds the body and insert holder in assembled relation.

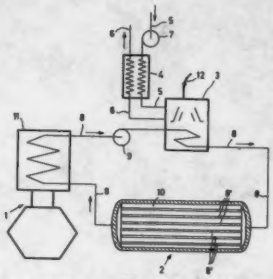
3,709,208
SURFACE HEATING DEVICE
William M. Schmidgall, Mapleton, Ill., assignor to Technological Products, Inc., Peoria, Ill.
Filed Jan. 6, 1971, Ser. No. 104,411
Int. Cl. E01h *5/10*
U.S. Cl. 126—271.2 A 9 Claims



A surface heating device comprising a housing supported on a mobile vehicle and having a blower at one end thereof and panel means dividing the housing into an upper inlet duct and a lower outlet duct that opens downwardly onto a surface to be treated. A blower is supported at one end of the housing and a furnace is supported within the inlet duct so that air will move through, in and around the firebrick of the furnace and move first to the blower and then through the outlet duct and onto the surface.

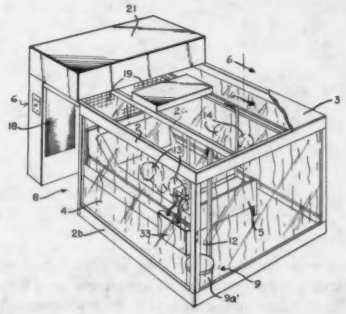
3,709,209
HEAT ACCUMULATOR
Johann Schroder, Aachen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 24, 1971, Ser. No. 174,357
Claims priority, application Netherlands, Aug. 29, 1970, 7012830; June 23, 1971, 7108625
Int. Cl. F24h *7/00*
U.S. Cl. 126—400 6 Claims

A heat accumulator which comprises a eutectic mixture of LiF and fluoride having a melting point of less than 850° C of the group constituted by sodium fluoride and/or magnesium fluoride. The mixture may additionally comprise potassium



fluoride and/or calcium fluoride. The heat accumulator is suitable for supplying thermal energy to a hot-gas engine and for use in heat accumulating ovens.

3,709,210
BED PATIENT ISOLATION SYSTEM
Frank E. Matthews, Reston, Va., assignor to Environmental General Corporation, Alexandria, Va.
Filed Jan. 27, 1971, Ser. No. 110,045
Int. Cl. A61b *19/00*
U.S. Cl. 128—1 R 12 Claims

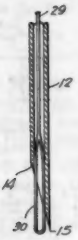


A bed patient isolation unit for isolating infection-susceptible patients from their environment or vice versa has a rigid frame of specially-formed beams supporting an enclosure including flexible side walls of transparent plastic sheeting equipped with pseudopodal sleeve-glove arms by means of which sterile manual access to the interior isolation area of the unit is provided. A filter-pump device at one end of the unit has air inlet and air outlet areas in the end wall providing a laminar flow of filtered air from the outlet area at a slight positive pressure with respect to the ambient, so that external contaminated air cannot enter the isolation area.

3,709,211
DIAGNOSTIC MYELOGRAPHY NEEDLE
Fred B. Hawkins, 5110 Courville, Toledo, Ohio
Filed July 2, 1970, Ser. No. 51,959
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 A 3 Claims

A surgical needle for injecting and removing fluid material from channels of the human body such as the spinal canal. The needle is provided with a lumen closed by a stylus during in-

sertion. The stylus is removed for permitting the injection of fluid and a second stylus smaller than the lumen and projecting beyond the end of the needle is inserted to prevent the body tissues from closing the lumen during aspiration of the injected fluids.

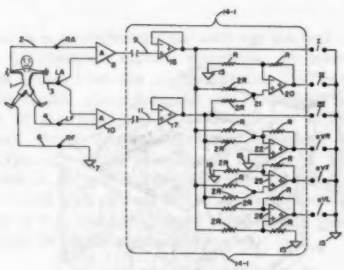


3,709,212

MULTICHANNEL ELECTROCARDIOGRAPH HAVING ONE LESS INPUT AMPLIFIERS THAN THE NUMBER OF SIGNALS TO BE MEASURED

William E. Koeblitz, Lyndhurst, Ohio, assignor to Gould Inc., Chicago, Ill.

Filed Aug. 5, 1970, Ser. No. 61,165
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 B **8 Claims**



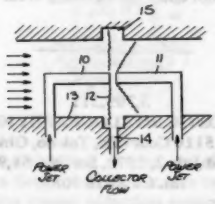
An electrocardiograph is described wherein one less input amplifier than the number of signals to be measured is coupled to circuitry for combining the signals with various scale factors to provide several different signals at different measuring terminals.

3,709,213

FLUID-POWERED FLOWMETER FOR MEASURING LOW FLOW RATES

John S. Yard, Warminster, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed Sept. 16, 1970, Ser. No. 72,747
Int. Cl. A61b 5/08
U.S. Cl. 128—2.08 **4 Claims**



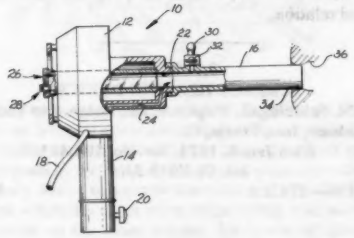
A fluid-powered flowmeter for measuring the flow rate of human breath or other relatively low levels of flow. The meter includes an open-ended flow tube for receiving the subject stream, the tube being provided with an inlet port for injecting therein a fluid from a regulated power source to produce a radial air pattern in the tube. Mounted on the outer circumference of the tube is a collector port adapted to capture the diverging jet stream, the collector being coupled to a flow transducer for converting the jet flow rate into corresponding electrical values. When the subject stream is blown into the tube, the radial air pattern is deflected away from the collector to an extent depending on the flow rate of the subject stream, thereby producing a proportional change in the electrical output which may be indicated or recorded, or fed into a computer for comparison with established norms.

3,709,214

GAS OBTURATING METHOD

Jack R. Robertson, 1430 E. Main Street, Santa Ynez, Calif.

Division of Ser. No. 885,248, Dec. 15, 1969, abandoned. This application Oct. 27, 1971, Ser. No. 193,217
Int. Cl. A61b 1/00
U.S. Cl. 128—4 **5 Claims**



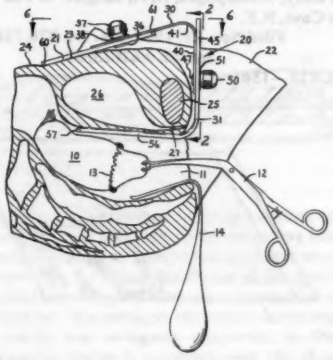
A method of diagnosis and/or therapy of an internal part of the body accessible from an adjacent body opening, characterized by the use of an endoscope having a passageway therein which terminates in a tubular distal end insertable into the opening and into close proximity to the desired body part, and including the steps of: placing the tubular distal end of the endoscope at the proximal end of the body opening. While simultaneously introducing a gas under pressure into the passageway in the endoscope at a rate such that the gas entering the body opening ahead of the tubular distal end of the endoscope acts as an obturator facilitating insertion so that the endoscope may be moved longitudinally of the body opening, and performing an indicated diagnostic and/or therapeutic operation on the desired body part through the passageway in the endoscope during and/or after movement of the tubular distal end of the instrument longitudinally of the body opening. The method includes the additional step of visually examining the walls of the body opening through the passageway in the endoscope as the tubular distal end of the instrument is moved longitudinally of the body opening so that the walls of the body opening are examined before the instrument can have any traumatic effect thereon. The tubular distal end of the endoscope comprises a removable barrel suitable for a particular diagnostic and/or therapeutic operation and replaceable by a different barrel suitable for a different diagnostic and/or therapeutic operation. Thus, the endoscope may be used as an anoscope, a proctoscope, a sigmoidoscope, a coloposcope, a hysteroscope, a culdoscope, an amnioscope, a urethroscope, a cystoscope, a laparoscope, and the like. The barrel may carry an inflatable cuff where appropriate to provide a substantially gas tight seal between the barrel and the periphery of the proximal end of the body opening.

3,709,215

ANTERIOR VAGINAL RETRACTOR FOR VAGINAL SURGERY

Stanley M. Richmond, 331 Eugene Medical Center, Eugene, Oreg.

Filed Dec. 28, 1970, Ser. No. 101,911
Int. Cl. A61b 17/02; A61m 29/00
U.S. Cl. 128—20 2 Claims



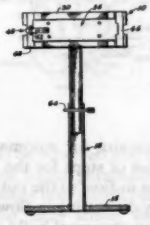
A triangular base member fits between the flexed thighs and bears downward against the suprapubic area of the lowest part of the abdomen. An adjustable angular extension on the base member has a downturned end portion adjustably connected with an upturned end portion of an L-shaped retractor blade. The blade has a horizontal insertable portion which presses upwardly against the vaginal wall giving the surgeon exposure and operating space and at the same time protecting the urethra and urinary bladder. The inserted portion of the blade underlies the base member and operates in the manner of a clamp wherein the downward pressure exerted exteriorly against the abdomen by the base member applies an upward pressure to the retractor blade. The anterior retractor is used in conjunction with a conventional weighted lower or posterior retractor.

3,709,216

SPINE-ADJUSTMENT MECHANISM

Byron L. Hilyard, 3837 English Avenue, Indianapolis, Ind., and Mario C. Santarossa, 5957 Wycombe Lane, Indianapolis, Ind.

Filed Aug. 2, 1971, Ser. No. 168,024
Int. Cl. A61f 5/37
U.S. Cl. 128—69 7 Claims



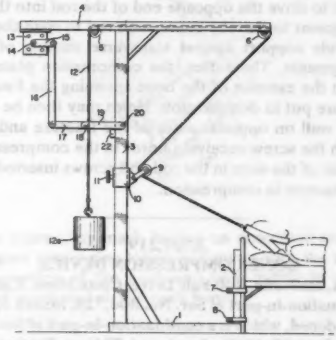
A rigid body-support and a rigid retainer provide rigid support of a person's hips and pelvic bones, achieving, when the person causes his upper torso to swing, a spinal "adjustment" of the spinal vertebrae.

3,709,217

INTERMITTENT TRACTION DEVICE

Samuel P. Powers, Dallas, Tex., assignor to Pulsar Corporation, Dallas, Tex.

Filed Feb. 1, 1971, Ser. No. 111,551
Int. Cl. A61h 1/02
U.S. Cl. 128—75 10 Claims



A device is provided for applying intermittent traction to a patient wherein a cable and weight assembly are mounted on a frame and a motor having a linkage mounted on the output shaft engages the cable to lift the weight and relieve the tension in the cable during one half a revolution of the motor and during the the other half revolution of the motor the weight is released to apply traction to the patient.

3,709,218

COMBINATION INTRAMEDULLARY FIXATION AND EXTERNAL BONE COMPRESSION APPARATUS

William X. Halloran, 440 Fair Drive, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 737,637, June 17, 1968. This application April 24, 1970, Ser. No. 31,697
Int. Cl. A61f 5/04
U.S. Cl. 128—92 A 13 Claims

A combination intramedullary fixation and external bone compression apparatus for applying fixation and compression to a bone which has been fractured transversely to form two longitudinal fragments. Such fixation device includes an elongated intramedullary rod for extending substantially the full length of the intramedullary canal of the fractured bone. The intramedullary rod includes a plurality of longitudinally spaced through transverse screw-receiving slots. A compression device is provided which includes a plate for being disposed exteriorally of the bone and spanning the fracture. Such plate includes screw-receiving bores disposed on opposite sides of the fracture whereby an incision may be made in the injured limb adjacent the fracture and the rod inserted

through such incision and into the intramedullary canal off one of the bone fragments. The rod may then be driven into the intramedullary canal to drive the leading end of the rod out of one end of the bone fragment sufficiently far to cause the trailing end of such rod to be totally received within such one fragment. Thereafter, the bone fragments may be set and the projecting end of the rod driven back into the intramedullary canal to drive the opposite end of the rod into the second bone fragment to thereby cause such rod to span the fracture and provide support against transverse shifting of the two bone fragments. Thereafter, the compression plate may be placed on the exterior of the bone spanning the fracture and the fracture put in compression. Holes may then be drilled in the bone wall on opposite sides of the fracture and in alignment with the screw-receiving bores in the compression plate and certain of the slots in the rod and screws inserted to maintain the fracture in compression.

3,709,219

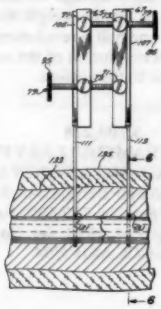
BONE COMPRESSION DEVICE

William X. Halloran, 440 Fair Drive, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 804,729, March 5, 1969, abandoned, which is a continuation-in-part of Ser. No. 737,688, June 17, 1968, abandoned. This application Nov. 27, 1970, Ser. No. 93,173

Int. Cl. A61f *5/04*

U.S. Cl. 128—92 A **10 Claims**



A bone compression device including first and second arms having respective first and second pins mounted thereon and projecting from one end thereof. First and second pairs of first and second couplings are rotatably mounted in spaced apart relationship on the respective arms. Externally threaded tightening rods screw through the respective first couplings and are rotatably connected with the second couplings whereby the pins may be engaged with bores formed in a fractured bone on opposite sides of a fracture and the rods rotated to draw the arms together and compress the fracture.

3,709,220

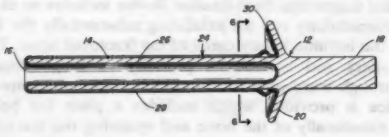
APPLICATOR FOR AN INTERNAL PROPHYLACTIC APPLIANCE

Albert C. Boyden, 4306 Procter Place, San Diego, Calif.

Filed Oct. 23, 1970, Ser. No. 83,452

Int. Cl. A61f *13/00, 5/46*

U.S. Cl. 128—132 R **4 Claims**



The applicator comprises a tube having an opening at one end and a handle for manipulating the applicator at the opposite end of the tube. The tube receives a substantial portion of an impervious bag including the closed end thereof and carries the remainder of the bag on the exterior thereof, the tube having sufficient rigidity to insert the bag in position in a urethra.

3,709,221

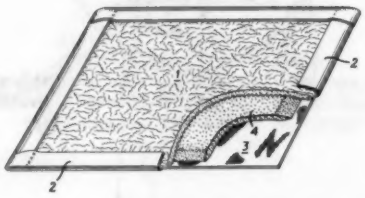
MICROPOROUS NONADHERENT SURGICAL DRESSING

Phyllis Riely, Massapequa, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Nov. 21, 1969, Ser. No. 878,716

Int. Cl. A61l *15/00*

U.S. Cl. 128—156 **11 Claims**



A composite surgical dressing that is highly absorbent, capable of preventing leakage or exudation from open wounds and capable of preventing contamination from entering or escaping from the wound, comprising an outer microporous, liquid-repellent fibrous layer having a maximum pore size of 0.5 micron, and a voids volume of at least 50 percent; an inner macroporous, fibrous layer, the body-contacting face of which is non-wetted by body fluids; and a highly absorbent intermediate layer between the outer and inner layers.

3,709,222

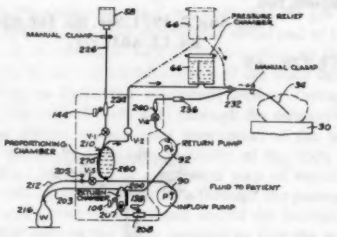
METHOD AND APPARATUS FOR AUTOMATIC PERITONEAL DIALYSIS

James H. DeVries, Ann Arbor, Mich., assignor to Sarns, Inc., Ann Arbor, Mich.

Filed Dec. 28, 1970, Ser. No. 101,636

Int. Cl. A61m *5/00*

U.S. Cl. 128—213 **21 Claims**



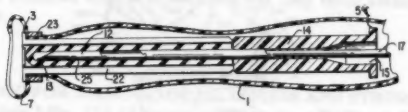
A method and apparatus for automatic peritoneal dialysis which includes a series of steps for the exchange of dialysate which proportions the in-flow to the out-flow and provides for the elimination of any distressing in-flow or out-flow pressures on the patient and any abnormal build-up of fluid quantity in the patient. The apparatus includes a portable bed-side unit which carries the necessary pumps and valves for the automatic cycle and includes a disposable plastic sheet unit supported on the apparatus which is positioned such that pumps and valves in the apparatus can operate on this unit when in place.

3,709,223

CONTAMINATION-PREVENTING SHEATH AND RETAINING SLEEVE FOR INTRAVENOUS CATHETER

Fidel Villaluna Macalalad, Lake Forest, and Dean R. Katerndahl, Wheaton, both of Ill., assignors to Abbott Laboratories, N. Chicago, Ill.

Filed May 26, 1970, Ser. No. 40,519
Int. Cl. A61m 5/00
U.S. Cl. 128—214.4 8 Claims



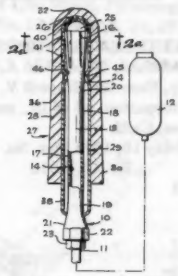
Disclosed herein is a contamination-preventing sheath fitting over the portion of a catheter tube extending from the hub of a cannula needle in an intravenous catheter assembly. The catheter assembly for which the device of the present invention is particularly designed includes a protective sheath formed of at least two like portions, the sheath extending over the cannula needle and swingably connected to the hub thereof. An annular sleeve is provided over the sheath to clamp the two halves together and protect the patient against injury once the catheter tube has been inserted and the needle removed. The sheath for protection against contamination of the catheter tube extends beneath the sleeve and can be readily removed from beneath the sleeve once the assembly is positioned for connection to an administration set.

3,709,224

SHEATH ASSEMBLY FOR DOUCHE NOZZLE

Sol B. Fielding, 11930 Kearsarge Street, Los Angeles, Calif.

Continuation-in-part of Ser. No. 35,682, May 8, 1970, abandoned. This application Aug. 9, 1971, Ser. No. 170,205
Int. Cl. A61m 3/00
U.S. Cl. 128—239 27 Claims



A sheath structure to be received about a douche nozzle tip including a deformable liquid permeable sheath or cushion body containing a passage into which the douche nozzle may project, with a tubular liner stiffer than the sheath body received within that body and about the nozzle and preferably having an inner end wall engageable by the nozzle to prevent its projection through the end of the sheath body. The tubular element may have a shoulder or shoulders engageable with the nozzle in a fluid sealing relation, to prevent liquid from passing outwardly along the outside of the nozzle.

3,709,225

FIGURE CONTOURING MASK

Jack Sobel, 25 Potter Street, Patchogue, N.Y.

Filed Dec. 21, 1970, Ser. No. 100,125
Int. Cl. A61f 7/00
U.S. Cl. 128—254 8 Claims

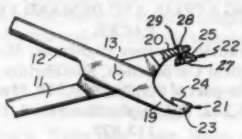
A figure contouring mask having an absorbent surface to retain a figure contouring lotion in contact with the chin and the upper portion of the neck and held tightly in place by elastic head bands and elastic neck bands.

3,709,226

SURGICAL NEEDLE HOLDER

Manuel V. Santos, 115 Ferry Street, Newark, N.J.

Filed June 25, 1970, Ser. No. 49,597
Int. Cl. A61b 17/06
U.S. Cl. 128—340 4 Claims



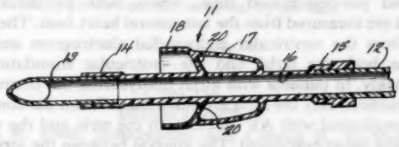
A surgical needle holder having a pair of grasping jaws movable in opposition to each other in response to elongated scissor arms which are pivotally mounted to each other, at the jaws being offset from the plane of movement of the scissor arms, at least one of the jaws comprising a hemispherical member rotatably mounted to one of the offsets and engageable to the opposing jaw upon movement of the arms toward each other.

3,709,227

ENDOTRACHEAL TUBE WITH POSITIVE CHECK VALVE AIR SEAL

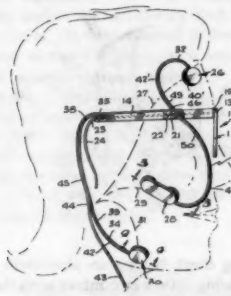
Ronald Hamilton Hayward, Temple, Tex., assignor to Scott and White Memorial Hospital and Scott, Sherwood and Brindley Foundation, Temple, Tex.

Filed April 28, 1970, Ser. No. 32,627
Int. Cl. A61m 25/00
U.S. Cl. 128—351 3 Claims



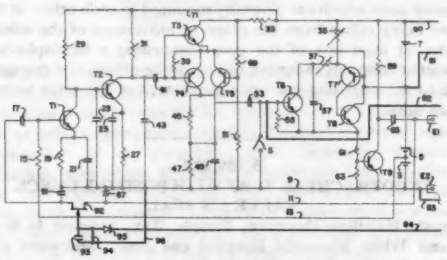
An endotracheal tube for ventilation of the lungs wherein a valve member is provided to seal against the walls of the trachea and wherein said valve has a flexible lip mounted on a hollow flexible body and wherein said body is inflated by forcing gas into the patient's lungs.

3,709,228
APPARATUS FOR FACIAL STIMULATION
Donald E. Barker, 15225 Vanowen Street, Van Nuys, Calif.
Filed Jan. 7, 1971, Ser. No. 104,609
Int. Cl. A61n 1/18
U.S. Cl. 128—410 16 Claims



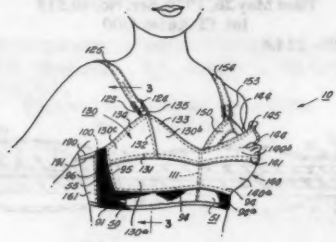
A device for electrically stimulating the facial nerves and thereby the facial muscles of a user, and preferably including a frame which rests on and is supported by the nose and ears of a user, and has deformable arms projecting from opposite side portions of the frame and carrying electrodes for contacting the user's skin.

3,709,229
FREE-RUNNING ATRIAL AND DEMAND VENTRICULAR PACER
Barough V. Berkovits, Newton Highlands, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Continuation-in-part of Ser. No. 810,519, March 26, 1969, Pat. No. 3,595,242. This application Feb. 9, 1971, Ser. No. 113,877
Int. Cl. A61n 1/34
U.S. Cl. 128—419 P 6 Claims



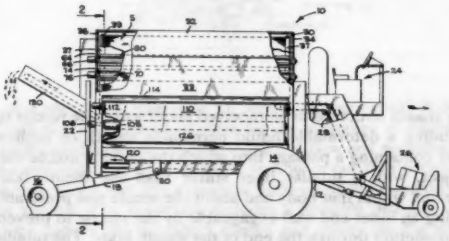
An atrial and ventricular (bifocal) demand pacer. A device is disclosed for providing electrical stimulation to the atrium after a first pre-determined time, and to the ventricle after a second pre-determined time, where both pre-determined times are measured from the last natural heart-beat. The pacer monitors the ventricular endocardial electrogram and programs both the atrial and the ventricular stimulation accordingly. In patients with atrial bradycardia but normal AV conduction, only the atria are stimulated. When the condition is complicated with AV block, both the atria and the ventricles are pacer-controlled. The interval between the atrial and ventricular stimulation is selected to facilitate the proper atrio-ventricular timing sequence. The pacer does not compete with spontaneous ventricular contractions. A free-running atrial and ventricular demand pacer is disclosed for treating patients suffering from sinus arrest (no spontaneous atrial activity) concurrent with intermittent AV block.

3,709,230
BRASSIERE
Alberta Penny Rich, 9814 Kilarney Drive, Dallas, Tex.
Filed Jan. 27, 1971, Ser. No. 110,210
Int. Cl. A41c 3/00
U.S. Cl. 128—486 9 Claims



A brassiere including a pair of breast uplifting support bands suspended by an elastic panel structure connected with chest encircling structure. The elastic panel structure is secured along the lower edges and the outward ends of the support bands and engage the chest of the wearer. Each of the support bands includes integral end portions forming truss triangles which aid in distributing the forces involved in breast support and contour. The shape, manner of suspension, a grain of the material forming the breast support bands provides optimum supporting and shaping of each of the breasts of the wearer. A suspension band extends along the upper sides and across the top of each breast and is connected with the support band for the encircled breast. A breast covering cup is secured with each elastic panel over each support band encircling panel providing a non-supporting covering for the breast encircled by the band. Each breast support band is drawn substantially taut along a generally straight line below the breast supported by the band while the arcuate shape of the upper edge of the band permits the band to form a proper breast supporting shape which retains its shape and does not turn down at its apex. Adjustable fasteners are provided at the back of the chest encircling structure, and adjustable shoulder straps are removably secured from the apex of each of the breast encircling suspension bands extending rearwardly to a back portion of the chest encircling band providing a shoulder strap for each shoulder of the wearer for symmetrical support of the brassiere along both the back and chest of the wearer.

3,709,231
MULTI-BEATER THRESHER
Olin L. Looker, Milford; Frederick A. Zemke, Hoopeston; David R. Knicely, Roosville; Russell V. Rouse, and Larry L. Slates, both of Hoopeston, all of Ill., assignors to FMC Corporation, San Jose, Calif.
Filed May 10, 1971, Ser. No. 141,900
Int. Cl. A01d
U.S. Cl. 130—30 H 19 Claims



A legume harvester has a large rotating screen and a central beater and four satellite beaters. An upfeed stripper beater

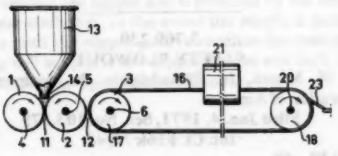
receives material from the upfeed side of the screen and a control beater beneath receives material from the upfeed stripper. The control beater flings the material to the central beater which in turn flings it to the screen for sieving. A downfeed stripper beater strips material from the screen and flings it back to the central beater. In one embodiment a sieving beater receives the material from the central beater and flings it to a lower portion of the screen for sieving. In another embodiment the central beater flings the material against the screen for sieving. Then, a second downfeed stripper beater strips the material from the screen and returns it to the central beater which flings it to a lower portion of the screen for sieving. A smaller diameter screen version employs only three satellite beaters.

3,709,232

METHOD FOR MAKING TOBACCO WEBS AND STRINGS

Lars Edvin Lilja, 124 43 Farsta, and Erik Arne Wallberg, 552 66 Jonkoping, both of Sweden, assignors to Arenco Aktiebolag, Vallingby, Sweden

Filed Dec. 14, 1970, Ser. No. 97,722
Int. Cl. A24b *3/14*
U.S. Cl. 131—140 C **15 Claims**



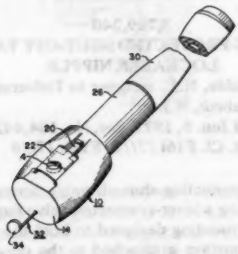
Lengthy tobacco webs or strings are formed of a pasty mass which contains finely disintegrated tobacco by introducing said mass in a gap between at least two rolls or the like of a pair of rolls, those surfaces of which, which are in engagement with the tobacco mass, travel in closed trajectories. The tobacco webs or strings are made to follow a predetermined one of said surfaces and to come loose from the other surface by intentionally selecting as said predetermined surface a surface having a greater adhesiveness in respect of said tobacco mass than the other surface in the respective pair of rolls.

3,709,233

TOBACCO PIPE CONSTRUCTION

Salvatore Stelitano, 324 13th Street, Pittsburgh, Pa.

Continuation of Ser. No. 13,354, Feb. 24, 1970, abandoned. This application Oct. 27, 1971, Ser. No. 193,223
Int. Cl. A24f *01/28, 05/10*
U.S. Cl. 131—176 **2 Claims**



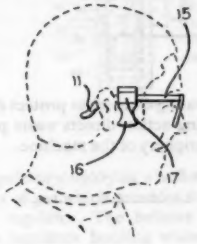
A tobacco pipe comprising a bowl closed at one end and open at its other end to receive tobacco to be smoked. A pipe stem assembly is inserted into and closes the open end of the bowl after it is loaded with tobacco; while the tobacco is ignited by a match or lighter through a small opening in the side of the bowl adjacent its closed end. The side opening is preferably provided with a sliding cover. In this manner, the burning tobacco is enclosed by the bowl, preventing spillage of ignited embers and possible damage to clothes, rugs, furniture and the like. The bowl of the pipe is preferably lined with an aluminum or the like liner. This enables the bowl to be constructed from a wood other than the more expensive briar wood ordinarily used.

3,709,234

HAIR STYLING TEMPLATE

Robert Seerahn, 1103 Navarino Street, Algoma, Wis.

Filed June 28, 1971, Ser. No. 157,324
Int. Cl. A45d *24/36*
U.S. Cl. 132—45 R **4 Claims**



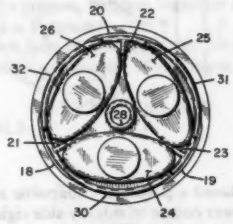
A frame, shaped somewhat like a spectacle frame, fits over the nose and ears. Templates may be slipped on to the temples or the nose piece of the frame to assist in shaping sideburns or mustache. A calibrated scale locates the template position.

3,709,235

TRAVEL CASES

Oliver K. Washburn, White Bear Lake, Minn., and Robert M. Washburn, Mahtomedi, Minn., assignors to W. O. Washburn & Sons, Inc., St. Paul, Minn.

Filed March 17, 1971, Ser. No. 125,063
Int. Cl. A45d *27/22, 34/00;* **B65d** *25/10*
U.S. Cl. 132—80 R **4 Claims**



A compact travel case and storage case having individualized bottle compartments that partially conform to the shape of the bottles to thereby hold the bottles in a position where they can readily be viewed and removed by the user.

3,709,236

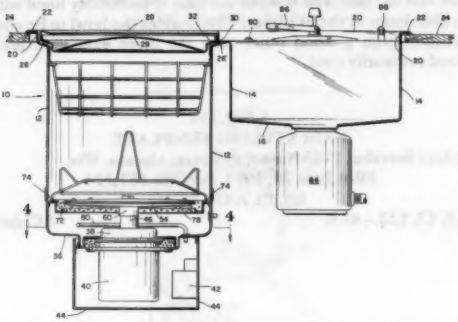
DISHWASHER

Thomas R. Field, Indianapolis, and Clinton H. Beckwith, Knightstown, both of Ind., assignors to Jenn-Air Corporation, Indianapolis, Ind.

Filed Dec. 8, 1969, Ser. No. 882,955
Int. Cl. B08b *3/02*
U.S. Cl. 134—104 **6 Claims**

A side-by-side top loading dishwasher in combination with a sink wherein the wall therebetween in conjunction with a

specific closure for the dishwasher is adapted to direct accidental water overflow into the sink. A disk-shaped spray



head overlies the heating element to protect dishes from direct radiation. Its spinning action directs waste particles centrifugally to the outer periphery of the machine.

3,709,237

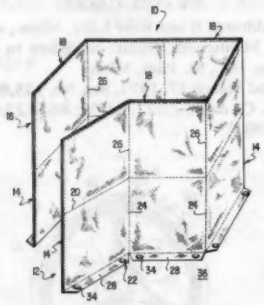
SPORTSMAN'S BLIND

Donald K. Smith, 727 West Outer Drive, Oak Ridge, Tenn.

Filed Dec. 7, 1970, Ser. No. 95,628

Int. Cl. E04h *17/00*

U.S. Cl. 135—5 R **4 Claims**



There is disclosed a portable, collapsible sportsman's blind comprising a lower course of side-by-side rigid hinged sections and an upper course of similar side-by-side rigid hinged sections. The upper and lower courses are hinged together. When installed, a partial enclosure may be provided by folding the sections with respect to each other. When collapsed for transport, the courses as well as the sections may be folded into juxtaposition.

3,709,238

UMBRELLA

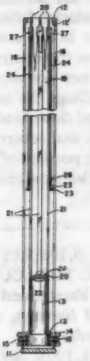
Norbert Leopoldi, 4180 Marine Drive, Chicago, Ill., and Kenneth C. Rolin, Sr., 28 Hillside Avenue, Grayslake, Ill.

Filed March 26, 1971, Ser. No. 128,307

Int. Cl. A45b *19/00*

U.S. Cl. 135—20 R **4 Claims**

A retractable umbrella having a central tubular storage handle into which a top cover and multiple stays slide or telescope when retracted for storage, and from which the cover and stays are propelled axially to open in an outwardly expanding



direction to provide a top cover adapted to be carried by means of the central tubular handle.

3,709,239

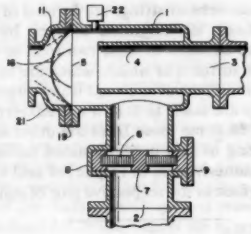
SAFETY BLOWOUT

Charles W. Morck, Jr., Philadelphia, Pa., assignor to Selas Corporation of America

Filed Jan. 4, 1971, Ser. No. 103,579

Int. Cl. F16k *17/40*

U.S. Cl. 137—68 **4 Claims**



The invention is a safety blowout for use in combustion systems that is provided with a rupture disc which will break at a predetermined pressure. The disc is so made that when it ruptures, portions thereof will tear and bend outwardly without any flying particles.

3,709,240

FROST HEAVE-PROTECTED SHUT-OFF VALVE WITH LOCKABLE NIPPLE

August Milo, Hillside, N.J., assignor to Universal Valve Company, Inc., Elizabeth, N.J.

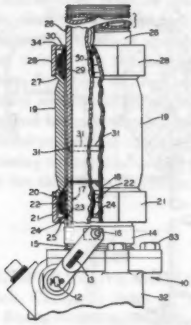
Filed Jan. 6, 1971, Ser. No. 104,442

Int. Cl. F16l *27/12*; F16k *17/36*

U.S. Cl. 137—68 **1 Claim**

A frost heave-protecting shut-off valve consists of a lower body portion having a lever-connected valve flap connectable to a fusible link mounting designed to hold the flap normally open. A bonnet portion is attached to the upper part of the body and it has a shear groove connecting with the link, and a circumferential groove and a retaining ring in the circumferential groove. A sealing sleeve having a threaded sealing union member at its lower end is connected in slidable and sealing engagement with the bonnet portion. The union member has a flange designed to stop further upward movement of the sleeve when the flange engages the ring. A nipple, having its lower end slidably engaged in the upper portion of

the sleeve, and serving as the valve outlet, also has a circumferential groove on its portion within the sleeve. The sleeve also has a threaded sealing union member at its upper end in slidable and sealing engagement with the nipple end, and the union member also has a flange. A spring retaining ring is



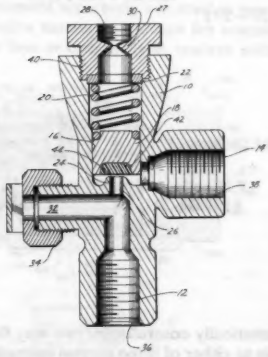
disposed around the nipple and is retained by the latter flange in a manner such that, in the event the nipple is pulled out of the sleeve until the nipple groove reaches the spring ring, the latter ring will snap into the nipple groove and lock the nipple against any further upward movement.

3,709,241

FILL LIMITER, CHECK AND SAFETY VALVE

Robert W. McJones, 529 Via Del Monte, Palos Verdes Estates, Calif.

Filed Dec. 11, 1970, Ser. No. 97,061
Int. Cl. F16k *17/40*
U.S. Cl. 137—71 **3 Claims**



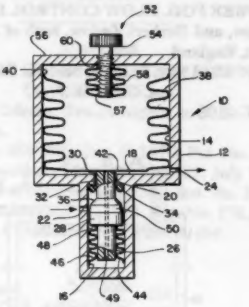
A fill limiter, check and safety valve has a body with an inlet passage for receiving gas from a source, an outlet passage for passing gas to tanks to be charged and a check valve between the two passages which prevents flow from the outlet passage to the inlet passage and, in addition, prevents inlet pressure from exceeding a predetermined level. A safety passage opens into the inlet passage and is capped by a burst disc assembly. A plug or fitting caps the bore in which the valving element is disposed and is adapted to lead to a gauge. The fitting has an orifice to prevent pressure surges from affecting gauge readings.

3,709,242

PRESSURE REGULATOR

Charles P. Chase, La Habra, Calif., assignor to Beckman Instrument, Inc.

Filed Dec. 4, 1970, Ser. No. 95,202
Int. Cl. F16k *31/145*
U.S. Cl. 137—81 **1 Claim**



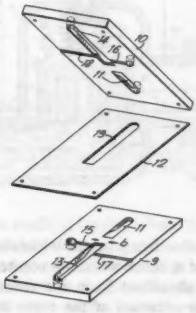
A pressure regulator employing a hollow bellows containing a precise amount of gas which provides the reference pressure source for the regulator. The bellows is mounted in one chamber of the regulator housing while a valve element is mounted in a second chamber. One end of the element extends through a port interconnecting the two chambers and is connected to the bellows. An inlet port in the housing communicates with the chamber containing the valve element while an outlet port provides communication between the bellows chamber and the exterior of the housing. As pressure increases at the outlet port, the bellows compresses causing the valve element to close the port interconnecting the two chambers within the housing.

3,709,243

SWITCH DEVICE FOR FLUIDIC LOGICAL CIRCUIT

Andre Wieme, Zwevegem, Belgium, assignor to N. V. Bekaert S. A., Zwevegem, Belgium

Filed June 26, 1970, Ser. No. 50,017
Claims priority, application Netherlands, July 1, 1969, 6910039
Int. Cl. F15c *1/08, 5/00*
U.S. Cl. 137—81.5 **7 Claims**



A switch device or element for a fluidic logical circuit, and more particularly to the construction of two airtight combined bodies, e.g., plates, between which a perforated foil is present.

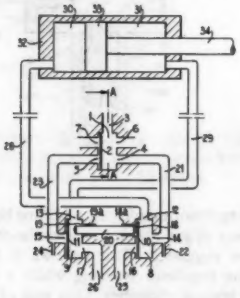
The two combined bodies have recesses cooperating with openings through the foil to form a plurality of chambers and channels. Fluids passed through the chambers and channels then function as fluid logical circuit elements in the form of, for example, gates, amplifiers, etc.

3,709,244

FREE FOIL FLOW CONTROL DEVICE

Hanni Zadow, and Herbert Zadow, both of 17 Rosedale Road, Stockport, England

Filed Nov. 4, 1970, Ser. No. 86,659
Int. Cl. F16k *31/12*
U.S. Cl. 137—106 22 Claims



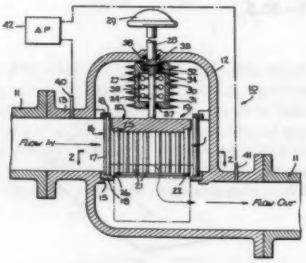
The invention provides a fluid flow control valve having a chamber with one inlet and at least one outlet and a movable plate or foil movable within the chamber to open and close the outlet or outlets. Control means communicate with the chamber to actuate the plate or foil and said control means may be pneumatic, hydraulic, electrical or mechanical. Two or more of the control valves can be coupled together to form a valve assembly.

3,709,245

CONTROL VALVE AND PROCESS CONTROL SYSTEM

Joseph O'Connor, Jr., Goshen, N.Y., assignor to Kieley & Mueller, Inc., Middletown, N.Y.

Filed Feb. 5, 1971, Ser. No. 112,890
Int. Cl. F16k *47/00*
U.S. Cl. 251—127 9 Claims



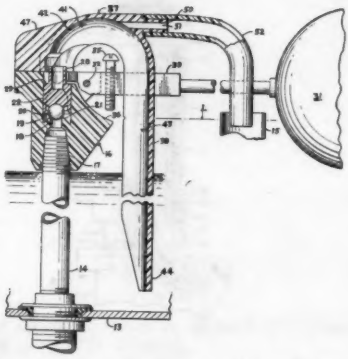
The control valve has a stator which imparts a swirl to the flow of fluid and a rotor which is rotated under the swirl of fluid. Energy is absorbed from the rotor in various ways. In one instance, the rotation of the rotor is subjected to a drag force which is induced in opposition to the force of rotation in order to control the pressure drop in the flow. In another instance, the rotation of the rotor is used to store electrical energy which can be used for other purposes throughout the process system.

3,709,246

WATER INLET CONTROL MEANS FOR TOILET TANKS

Henry J. Kachergis, 89 Larchmont Avenue, Waterbury, Conn.

Filed July 26, 1971, Ser. No. 166,103
Int. Cl. F16k *45/00*
U.S. Cl. 137—216 7 Claims



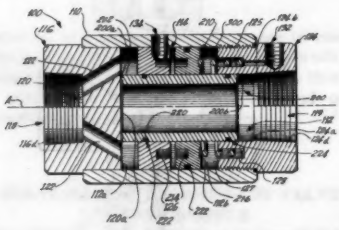
An improved water inlet control for toilet tanks of light weight simple construction, has an inverted U-shaped deflector channel for conducting water from an upwardly discharging cutoff valve to a down spout leading into the tank. The water is not forced to change direction abruptly at any point. The open channel itself serves as a true vacuum breaker, without pulling in air during normal operation, and the float controlled valve may function as a check valve when the float is down, thus giving complete assurance against the possibility of back flow if a vacuum should occur in the supply pipe.

3,709,247

MULTI-PURPOSE PISTON VALVE

Verlon C. Roth, and Arden J. Roth, both of 2279 Trinway Avenue, Simi Valley, Calif.

Filed June 7, 1971, Ser. No. 150,454
Int. Cl. F16k *31/58*
U.S. Cl. 137—271 7 Claims



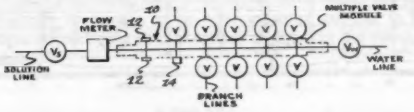
A pneumatically controllable, two-way fluid shut-off valve convertible to either of three normal operating states. A housing includes a tubular sidewall defining a chamber elongated between first and second chamber ends, a ring-shaped spring stop is affixed in sealing relation around the inside of the sidewall spaced away from and adjacent to the first chamber end. The housing also includes an end cap connected to the sidewall at the first end of the chamber and comprises a first input/output port, a separating wall in between the first port and the chamber and at least one passage between the chamber and the first port and a second end cap removably affixed to the sidewall at the second end of the chamber. The second end cap has a second ring-shaped spring stop extending into the chamber and a second input/output port extending from the exterior to the chamber. A removable tubular-

shaped shut-off piston is mounted in the chamber having a ring-shaped third stop affixed in sealing arrangement around the piston intermediate the ends thereof. The piston has a second end slidably mounted in the second port and the first end is adapted for sealing engagement with the separating wall. The piston is slidable between a shut-off position against the separating wall and an open position spaced away from the separating wall. The first, second and third spring stops are positioned and constructed to leave space for a compressed bias spring on either side of the third stop, regardless of the position of the piston. Separate sliding seals are provided in between the third stop and the sidewall, in between the first stop and the piston and in between the second port and the piston. First and second pneumatic control ports, respectively, pass through the housing to the chamber at a position which is on opposite sides of the third stop regardless of the position of the piston.

3,709,248
MULTIPLE VALVE MODULE

Christoph W. Aurich, Clemson; John C. Bryant, Fort Mill, both of S.C., and James R. Riley, Stanley, N.C., assignors to Gaston County Dyeing Machine Company, Stanley, N.C.

Filed Feb. 26, 1971, Ser. No. 119,172
Int. Cl. F16k *19/00*
U.S. Cl. 137—271 **2 Claims**

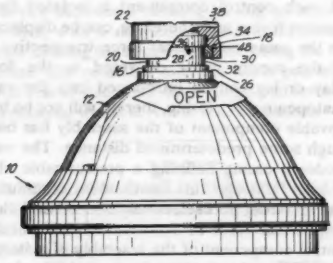


A multiple valve module is provided by which a given supply fluid may be selectively distributed to any of a group of stations to be supplied, or any of a group of supply fluids may be selectively fed to a given station. The module includes a manifold having an exterior valve mounting surface through which a series of spaced flow ports open, valve means separately mounted at each of a selected plurality of the flow ports, a blocking element separately mounted at any flow port not occupied by valve means and means for connecting the manifold in a flow line or optionally in tandem with another module.

3,709,249
PROTECTION DEVICE FOR THE OPERATING MEMBER OF A FIRE HYDRANT

Raul Ralph Diaz, 123 Clinton Place, Brooklyn, N.Y.

Filed Feb. 12, 1971, Ser. No. 114,915
Int. Cl. F16k *35/06*
U.S. Cl. 137—296 **5 Claims**

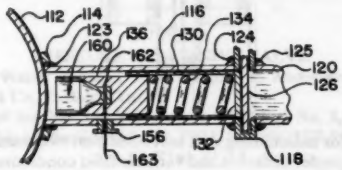


The polygonal operating member of a fire hydrant is encircled and concealed by a washer and collar. The collar has a shoulder encircled and concealed by an outer member which rotates on the collar but is axially fixed to the latter. The collar is rotationally and axially fixed to the operating member for the application of torque to the latter. The collar is moreover provided with a flat chordal face exposed between the washer and outer member for engagement by a special wrench. The wrench has two legs cooperatively defining a cylindrical surface with a flat chordal face thereon.

3,709,250
APPARATUS FOR COMMUNICATING SERVICE LINES TO MAINS

Marcus L. Bates, Odessa, Tex., assignor to T. D. Williamson, Inc., Tulsa, Okla.

Division of Ser. No. 000,930, Jan. 6, 1970, Pat. No. 3,612,082, which is a continuation of Ser. No. 774,802, July 15, 1968, which is a division of Ser. No. 620,738, , Pat. No. 3,396,745.
This application Sept. 1, 1971, Ser. No. 176,812
Int. Cl. B23b *41/08*; F16e *41/04*
U.S. Cl. 137—318 **9 Claims**

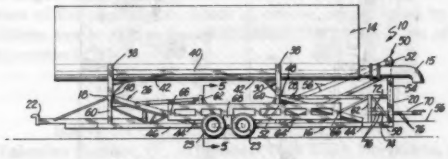


A device for facilitating the act of connecting a service line to a flowing main line. A gate type valve is rigidly attached to the main line and a barrel is removably affixed to the valve and is adapted to cooperate with a mandrel which includes a shaped charge at one extremity thereof. The mandrel cooperates with the barrel to enable the shaped charge to be positioned adjacent the main line, whereupon the explosive shaped charge perforates the main line when a detonator is activated. The mandrel is retrieved along with the barrel to enable further use of the device. The invention also comprehends a mandrel that can be affixed between the gate valve and the flowing main line by including a recoil device in conjunction therewith. The invention further includes a shaped charge that is adapted to be fabricated into the ball member of a ball type valve.

3,709,251
MOBILE COLLAPSIBLE SCAFFOLD

Warren H. Manor, 431 Raminda, La Puente, Calif.

Filed Sept. 15, 1970, Ser. No. 72,306
Int. Cl. F16l *5/00*
U.S. Cl. 137—343 **1 Claim**

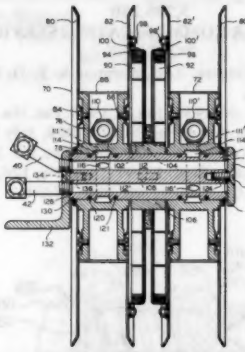


A mobile collapsible scaffold having a base frame mounting a supporting framework which is swingable between erect and collapsed positions, and ground wheels which move vertically with the framework relative to the base frame in such a way that the wheels lower to support the frame for travel when the framework is collapsed and raise to permit the frame to rest on the ground when the framework is elevated to erect position. In its primary application, the scaffold is a portable water tower mounting a water tank which is supported by and raises and lowers with the scaffold frame for supplying water to water tank trucks at an earth working site.

3,709,252
DUAL HOSE REEL

Arlo G. Bishop, Battle Creek, Mich., assignor to Clark Equipment Company

Filed June 1, 1970, Ser. No. 42,267
Int. Cl. B65h *75/36*
U.S. Cl. 137—355.17 **10 Claims**

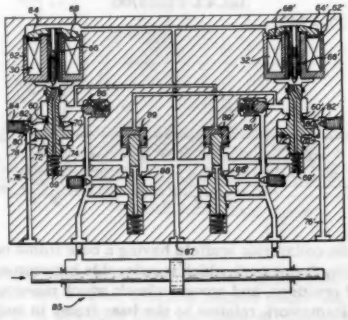


A reel for maintaining in a taut condition two parallel hose operating under different and variable fluid conditions such as encountered in the operation of the upright of industrial lift trucks having a carriage with an attachment thereon. The reel has a pair of reel sections rotatably mounted on a hub having longitudinal fluid passages therein. Each reel section is driven in the direction to wind the hose by a coil spring connected at one end to the reel section and at the other end to the hub, and includes a coupling and passages connecting the hose of each section with one of the fluid passages in the hub. A bracket secured to one end of the hub mounts the reel on a supporting structure, and s plate mounted on the other end of the hub closes the passages in the hub, the plate and bracket being interchangeable to permit the reel to be mounted on either side of a lift truck upright without reversing the reel.

3,709,253
VALVE CONTROL WITH DITHER

Gerhard Spangenberg, Sullivan's Island, S.C., assignor to Marotta Scientific Controls, Inc., Boonton, N.J.

Filed Sept. 23, 1970, Ser. No. 74,595
Int. Cl. F16k *31/06*
U.S. Cl. 137—595 **5 Claims**

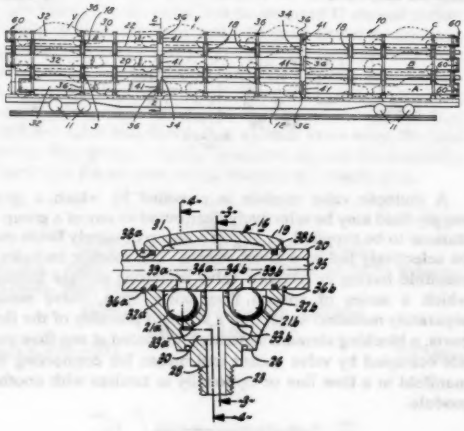


This invention is an electric controller which superimposes an oscillating signal on a load signal with feedback for controlling the resultant output signal. More specifically the invention has a mechanical element, particularly a poppet valve, that is operated by a signal applied to an actuator coil; and the superimposed oscillating signal causes dither of the mechanical element to overcome static friction and hysteresis. In the preferred construction, the dither signal passes from an inverting amplified to a biasing driver network, and then to a push-pull amplifier that has feedback for producing the oscillations. The preferred construction augments the oscillation by use of a voltage sensitive resistor in the feedback circuit. The dither frequency becomes lower as the valve approaches closed position. This produces greater magnitude of the dither and a degree of impact that seals the valve with less pressure required to hold the valve closed.

3,709,254
VALVE ASSEMBLY FOR WATER FOUNTAINS AND THE LIKE

Allen C. Wright, Moraga, Calif., assignor to Haws Drinking Faucet Company, Berkeley, Calif.

Filed Nov. 12, 1969, Ser. No. 875,873
Int. Cl. E03b *9/00*; **F16k** *51/00, 31/00*
U.S. Cl. 137—609 **5 Claims**



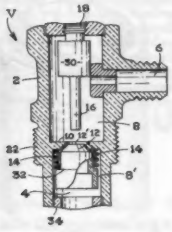
A valve assembly for controlling the flow of water to the discharge nozzle of water fountains and the like. The valve assembly is characterized by providing a complete change from fully closed to fully open position with a very small displacement of the movable control component of the valve assembly, and such control component is isolated from unbalanced pressure forces and, therefore, can be displaced with substantially the same mechanical force irrespective of the pressure of the supply water delivered to the fountain. Further, delay or lag can be introduced into the valve assembly so thatopening, or closing, thereof will not be initiated until the movable component of the assembly has been displaced through some predetermined distance. The valve assembly includes a casing defining a pressurizable chamber having an inlet passage in continuous communication therewith and an outlet port selectively opened and closed by a generally spherical valve in accordance with whether the movable control component of the assembly is in its open or closed position. The valve tends to be carried into closing engagement with the outlet port by the discharge of water therethrough, and it also tends to be sealingly related to such port because of the pressure differential developed across the valve when it is once in engagement with the port.

3,709,255

HIGH PRESSURE VALVES

Antonio Pasquale Ciotti, Hamilton, Ontario, Canada, assignor to Auto Anti-Pollution Devices of Canada Limited, Toronto, Ontario, Canada

Filed Feb. 12, 1971, Ser. No. 114,863
Int. Cl. F16k 21/04
U.S. Cl. 137—614.19 4 Claims



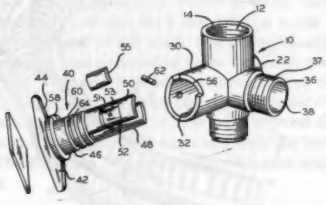
The present safety valve is installable in the mouth of a pressurized fluid container from which the fluid exits through an inlet, outlet and connecting passageway in the valve casing. A plug is provided in the passageway to close and completely seal it when a significant imbalance occurs between the fluid pressures in the valve inlet and the valve outlet respectively. The plug is then restorable to open position only by first closing and then reopening the safety valve, after which the plug will continue to remain in its open position subject to the precedent correction and subsequent absence of the pressure imbalance.

3,709,256

MEANS FOR CONTROLLING THE DIRECTION OF THE FLOW OF A LIQUID OR FLUID THROUGH A SELECTED OUTLET AND FOR SEALING SAID OUTLETS

William C. Gore, Elgin, and Eugene B. Shapiro, Highland Park, both of Ill., assignors to Beatric Foods Company, operating through its division Chicago Specialty Manufacturing Co., Skokie, Ill.

Filed Feb. 8, 1971, Ser. No. 113,140
Int. Cl. F16k 11/00
U.S. Cl. 137—625.47 5 Claims



The device includes a housing having an inlet and two or more outlets, with a manually rotatable member positioned within said housing for selectively controlling the flow through said outlets. The rotatable member has a pair of curvilinear arms, with one of said arms supporting a pad formed of a semi-resilient material which serves to seal the outlets.

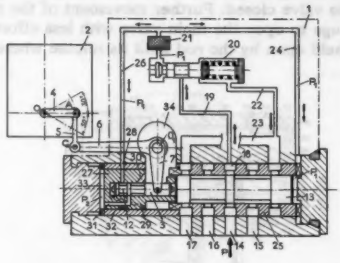
3,709,257

ELECTRO-HYDRAULIC SERVOMECHANISM

Jacques Faisandier, Chatillon-Sous-Bagneux, France, assignor to Societe D'Applications Des Machines Motrices, Issy Les Moulineau, France

Filed Sept. 23, 1970, Ser. No. 74,776
Claims priority, application France, Nov. 15, 1969, 6939403
Int. Cl. F16k 11/00
U.S. Cl. 137—625.64 10 Claims

A control valve including an electrical actuator and a two-stage hydraulic regulator. The regulator defines a closed-loop control where delivery of pressurized fluid to a load is managed and the regulator and actuator are isolated from one another except for a single fluid tight mechanical linkage.

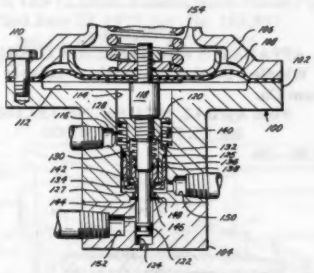


3,709,258

PRESSURE RESPONSIVE VALVE

Irvin B. Weise, Bellarie, Tex., assignor to Anderson, Greenwood & Co., Bellaire, Tex.

Division of Ser. No. 750,349, Aug. 5, 1968, Pat. No. 3,572,359.
This application Feb. 24, 1971, Ser. No. 118,418
Int. Cl. F16k 31/12
U.S. Cl. 137—627.5 4 Claims



An improved pilot valve having a discharge valve seat, a movable inlet valve seat which is connected to pressure responsive members, and a valve member adapted to engage both seats, wherein movement of the inlet valve seat affects the unseating of the valve member from only one of said valve seats at a time so that fluid flows through the pilot valve only when the controlled pressure between the valve seats is being changed. This abstract is neither intended to define the invention of the application, which of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,709,259

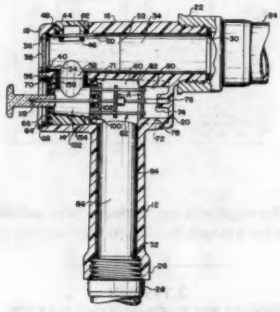
HAND OPERATED LOW PRESSURE VALVE

Valentine Hechler, IV, 26 Meadow View Road, Northfield, Ill.

Filed April 26, 1971, Ser. No. 137,540
Int. Cl. F16k 1/00
U.S. Cl. 137—630.15 13 Claims

A valve within a valve is described wherein the opening of the former reduces the opening pressure of the latter. A lost motion reciprocating linkage is provided between the valve actuating rod and the main valve to open a small inner port prior to the opening of the main valve. The linkage allows the valve to be self-closing. In one embodiment the main valve is axially supported on a cage and opens in the direction of the inlet flow to the valve. The valve operating rod carries a small inner valve that seats in a passageway through the main valve

and the rod engages the cage at spaced points whereby actuation of the rod opens the small valve first against the flow of fluid, thus relieving a substantial amount of the pressure holding the main valve closed. Further movement of the rod engages the cage to open the main valve with less effort. Both valves are held open by the rod until its release whereby the



flow of fluid around the cage and the small valve and around the large valve causes sufficient fluid friction to close both valves automatically. The opening force on the actuating rod can be applied from either end and the valves can be variously oriented in a valve housing according to the embodiments disclosed.

3,709,260

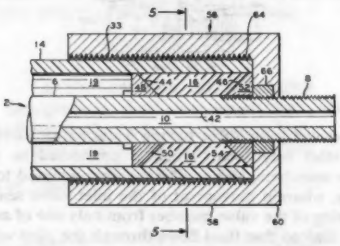
APPARATUS FOR TESTING CONDUIT

Tom J. Windle, Bartlesville, Okla., assignor to Phillips Petroleum Co.

Filed April 12, 1971, Ser. No. 133,166

Int. Cl. F16l *55/10, 47/00*

U.S. Cl. 138—90 **3 Claims**



An apparatus for passing fluid into a conduit for pressure testing said conduit. In one embodiment, a portion of a mandrel is maintained in sealable engagement within the conduit by a clamp that has pivotal portions for attachment and release of the clamp and, in another embodiment, a seal between the mandrel and the conduit is provided by compressing a resilient member of the mandrel.

3,709,261

THREAD PROTECTOR FOR THREADED PIPE SECTION ENDS OR THE LIKE

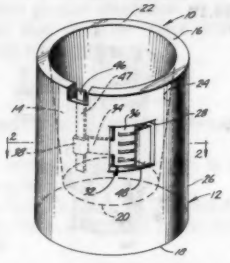
Lynn G. Jones, Downey, Calif., assignor to Global Marine Inc., Los Angeles, Calif.

Filed Sept. 10, 1970, Ser. No. 70,998

Int. Cl. F16l *57/00;* **B65d** *59/06*

U.S. Cl. 138—96 T **9 Claims**

A thread protector for the male threaded end of a length of oil well drill pipe includes a socket having a recess adapted to receive the male threaded end of a drill pipe. Tooth means are carried by the socket within the recess for locking the pipe end within the recess by engaging the threads of the pipe end about only a portion of the circumference of the pipe. The tooth means are biased relative to the socket into the recess. Means are defined in the socket for enabling the disengagement of the tooth means, against the bias thereof, from the threads. The protector is slid axially over the pipe end with the



tooth means riding along the threads until the latter is within the socket recess. The protector is then restrained from slipping off the pipe by the biased engagement of the tooth means with the threads. To remove the protector, the tooth means are moved against their bias to disengage the tooth means from the threads so the protector can be removed axially from the end of the pipe.

3,709,262

CIRCULAR WEAVING MACHINE

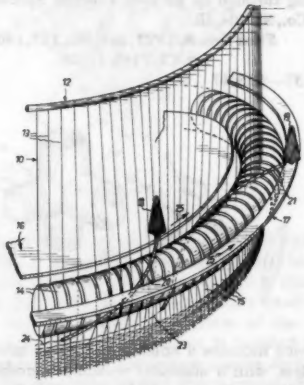
Hans Georg Braunschweiler, Winterthur, Switzerland, assignor to Georg Fischer AG. Brugg, Brugg, Switzerland

Filed March 8, 1971, Ser. No. 121,743

Claims priority, application Switzerland, March 10, 1970, 3510/70

Int. Cl. D03d *37/00*

U.S. Cl. 139—14 **9 Claims**



The present invention is devoted to devising a circular weaving loom in which the conventional shedding mechanism and shuttle circulating within the shed are unnecessary.

3,709,263

WOVEN FABRIC FOR NURSERY PLANT ROOT BALLS

Charles A. Jackson, Stirling, N.J., and Martin B. Katz, La Due, Mo., assignors to Thiokol Chemical Corporation

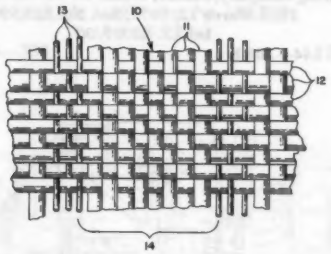
Filed Sept. 8, 1970, Ser. No. 70,262

Int. Cl. D03d *15/00;* **A01q** *9/10*

U.S. Cl. 139—420 **6 Claims**

A fabric woven of polyolefin ribbons is used for "balling" or wrapping the roots of plants and trees and the like. The fabric

of the invention comprises a woven material having a set, or series of deteriorable strips or yarns woven in at pre-selected



intervals, to provide spaces or "windows" for passage of the roots to the fabric and into the surrounding soil.

3,709,264

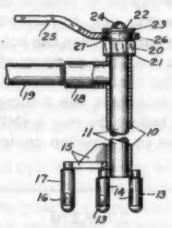
ELECTRICIAN'S WIRE BENDING TOOL

Roy E. Amman, 13627 187th Place S.E., Renton, Wash.

Filed Aug. 3, 1970, Ser. No. 60,459

Int. Cl. B21f *1/00, 7/00*

U.S. Cl. 140—106 **19 Claims**



This tool is suitable for bending and shaping wires which extend through the walls of meter bases and like electrical receptacles into the same in attaching the wires to terminals, The tool comprises a shaft rotatable within a frame tube, lever arms to relatively rotate the shaft and tube, a cross member rigid with the inner end of the shaft, two diametrically spaced apart wire bending pins protruding from the cross member, a radial arm rigid with and extending sidewise from the inner end of the frame tube, and a third pin rigid with the outer end of the arm and movable in a circular path around the other two pins. Short sharp bends can be made with the two spaced apart pins. The third pin helps in holding the wire and making longer bends.

3,709,265

SAWING AND DISCHARGING STATION FOR A TREE SLASHER

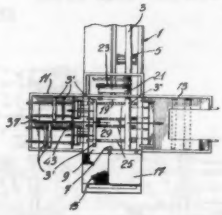
Jean Paul Tanguay, St. Prime, Quebec, Canada, assignor to Placements Jean Paul Tanguay Limited, Quebec, Canada

Filed Oct. 26, 1970, Ser. No. 83,850

Int. Cl. B27b *5/00*

U.S. Cl. 83—404.2 **7 Claims**

A sawing and discharging station for a tree slasher provided with a conveyor adapted to drive tree stems in a predetermined direction. The station comprises a transfer tables disposed to receive tree stems from the said conveyor and an arresting plate at the end of the table opposite the receiving end whereby tree stems may be driven by the conveyor until one end abuts the arresting plate. The station has a first rotary saw to cut the tree stems to produce logs of predetermined full length and a transfer conveyor movable perpendicularly to the direction of the tree stem conveyor to discharge logs cut by the first rotary saw selectively on either side of the table. A second rotary saw is mounted laterally of the tree stem con-



veyor and the arresting plate to cut logs obtained by the first saw into half length logs. The station finally comprises log collectors on either side of the table to receive the full and half length logs, respectively.

3,709,266

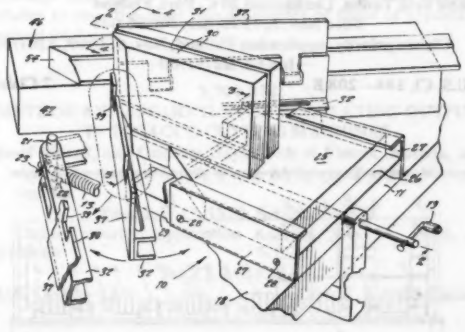
AUTOMATIC MITERING TOOL

Philip P. Fusco, 123-11 149th Avenue, South Ozone Park, N.Y.

Filed June 22, 1971, Ser. No. 155,587

Int. Cl. B27g *5/02*; **B27b** *27/06*

U.S. Cl. 83—761 **7 Claims**



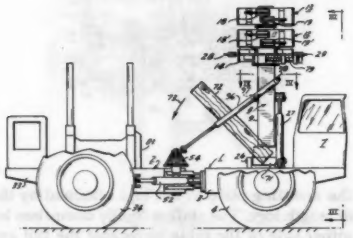
A mitering tool with an L-shaped box attachment, the tool automatically adjusting itself so that a mitering cut is made percisely along a plane that bisects the included angle formed by the two sides of a corner being constructed for a frame, the tool basically consisting of a riding block clamped stationarily to a work table, a horizontal threaded rod that is screwed through the riding block along a forward-rearward axis, the rod having a crank handle at a rear end and the forward end being attached to a vertical pivot pin to which a forward end of a pair of expansion track channels are pivoted, and which extend diagonally rearward so to define the angle of the corner therebetween, each channel having a longitudinal slot in which a fulcrum pin is fitted, each fulcrum pin being mounted on one forward corner of the riding block; and a support block that is attached to the pivot pin being slidable along a track that is formed along a forward-rearward axis of the riding block, the support block carrying a saw guide slot along the forward-rearward axis in which a saw is fitted so that the mitering saw cut is made on the bisected plane of the corner angle.

3,709,267

LOG HANDLING MECHANISM FOR TREE HARVESTERS

John Kurelek, Brantford, Ontario, Canada, assignor to Koehring-Waterous, Ltd., Brantford, Ontario, Canada

Filed Aug. 27, 1969, Ser. No. 853,455
Int. Cl. A01g 23/08
U.S. Cl. 144—2 Z 7 Claims



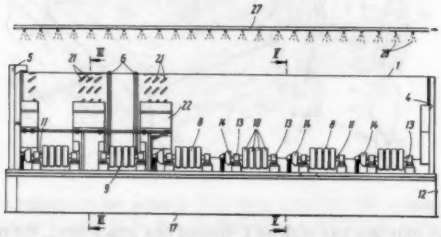
A pair of conical log impellers are mounted upright on the chassis of a tree harvesting machine at a fixed transverse spacing from each other and driven synchronously in opposite directions. A log dropped sidewise into the V-shaped gap between the impellers and bearing thereon at its opposite sides not only tends to advance lengthwise in a generally horizontal direction but also tends to adjust itself into alinement with a vertical plane bisecting the V-shaped gap.

3,709,268

DRUM BARKER

Rolf Erik Tuuha, Lansipuisto 20 C, Pori, Finland

Filed Nov. 2, 1970, Ser. No. 86,049
Claims priority, application Finland, Nov. 6, 1969, 3207/69
Int. Cl. B27l 1/00
U.S. Cl. 144—208 B 2 Claims



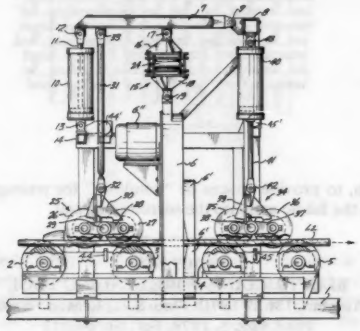
A drum barker including an elongated drum arranged to rest in a horizontal position and supported for rotation by several systems of motor driven wheels placed in a row on both sides of the drum and for axial movement by a set of wheels engaging a pair of guiding rings situated on the drum. The drum is adapted to receive through one end the timber to be debarked. The inner surface of the drum is provided with projections for removing the bark, while the outer surface is provided with slots through which the detached bark is discharged. A spray system is included for spraying a liquid on the timber either as it enters the drum to soak the bark or as it leaves the drum to facilitate the removal of loose bark from the timber, or both. The spray system may also spray the rotating and axially movable drum and the system of wheels to reduce the friction between the outer surface of the drum and its points of contact with the system of wheels.

3,709,269

LOG BARKER RING POSITION CONTROLLER

Peter J. Cervenak, Seattle, Wash., assignor to Nicholson Manufacturing Company, Seattle, Wash.

Filed March 12, 1971, Ser. No. 123,599
Int. Cl. B27l 1/00
U.S. Cl. 144—208 E 9 Claims



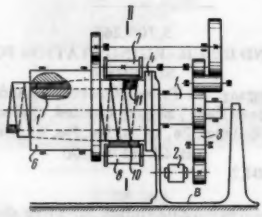
A rotary log barker ring and a log hold-down are suspended from a lever beam swingable to raise or lower the hold-down twice as far as the barker ring, for centering the barker ring relative to a log to be barked when the hold-down engages the upper surface of the log. The position of the barker ring is maintained briefly after the log has moved out of engagement with the hold-down to enable the trailing end of the log to clear the barker ring before the ring is shifted into a predetermined position of rest or a position centered with respect to the next log.

3,709,270

DEVICE FOR MANUFACTURING TUBULAR PRODUCTS

Viktor Petrovich Abramov; Yan Petrovich Junga; Gunard Valdemarovich Berzin; Voldemar Petrovich Skrupsky, all of Riga; Petr Nikolaevich Frolov, Moscow; Andrei Lukyanovich Lugovskoi; Felix, Alexandrovich Shilgorin, both of Odessa; Yan Yanovich Dalbinsh, Riga; Karl Arturovich Rotsen, Riga; Andris Eduardovich Ziemelis, Riga; Artur Eliksnis, Riga, and Bruno et al. Priede, Jurmala, all of U.S.S.R., assignors to Institut Khimii Drevesiny Akademii Nauk Latviiskoi SSR, Riga, U.S.S.R.

Filed Oct. 9, 1970, Ser. No. 79,497
Int. Cl. B27h 5/00
U.S. Cl. 144—268 1 Claim



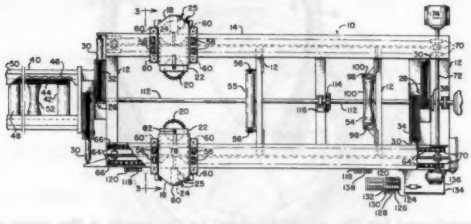
A device for manufacturing tubular products from wooden battens by winding the battens on a rotating core with the aid of an endless driving band which presses the batten against the core, and a system of circular elements for ensuring continuous feed and compaction of the battens.

3,709,271

METHOD AND APPARATUS FOR DEEP INCISING POLES

Lester W. Flory, Eugene, Oreg., assignor to L. D. McFarland Company, Sandpoint, Idaho

Filed July 1, 1971, Ser. No. 158,798
Int. Cl. B27
U.S. Cl. 144—309 15 Claims



Apparatus for deep incising longitudinal portions of the periphery of wood poles prior to impregnation with a preservative. The apparatus includes an elongate frame including clamps adapted to hold a wood pole between a pair of incising wheels mounted on said frame and adapted to run longitudinally on laterally opposed surface sections of the pole. Indexing means is provided to partially rotate the pole after the incising wheels have completed a run along the pole in one direction and prior to an incising run in the opposite direction. In one embodiment, electronic timing and control means are provided to automatically complete the incising of the entire surface of the pole once it is properly clamped in the machine.

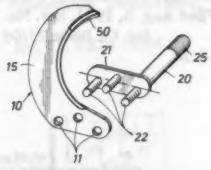
The method of deep incising the periphery of a longitudinal portion of a wood pole including clamping the pole; holding the pole between a pair of laterally opposed incising wheels; running said pair of opposed incising wheels along the pole in a first direction; partially rotating the pole; running the incising wheels along the pole in a direction opposite the direction of the first pass; and, repeatedly partially rotating the pole and incising laterally opposed longitudinal sections thereof until the entire periphery of said pole is deep incised.

3,709,272

LOG DEBARKING APPARATUS

Richard W. Bowers, P.O. Box 13, Waldo, Ark.

Filed July 8, 1971, Ser. No. 160,788
Int. Cl. B27l *1/00*
U.S. Cl. 144—208 E 10 Claims



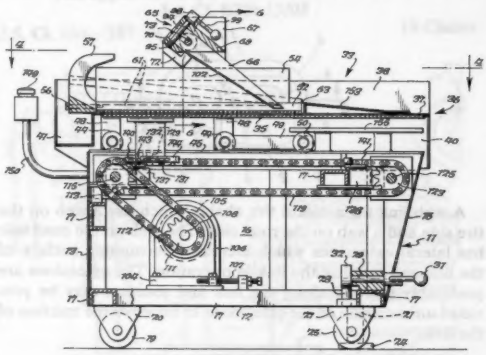
A curving arm member and mounting assembly for use with a ring type log debarker. The mounting assembly comprises a shaft and cantilevered mounting plate to which the arm member is attached in a plane perpendicular to the axis of the shaft. The arm member has front and rear faces reducing in width from base to tip and leading and trailing edges at opposite sides thereof. A bark cutting edge is provided at the tip. The front face and leading edge converge in a spiral-like log engaging climbing edge from the base to the top. The cutting edge and a substantial portion of the climbing edge are carried on a removable insert member.

3,709,273

FOOD SLICING APPARATUS

Andre Robert Jaccard, Buffalo, N.Y., and Bernhard Hinkers, Werther, Germany, assignors to Jaccard Corporation, Erie, N.Y.

Filed July 21, 1970, Ser. No. 56,844
Int. Cl. B26d *4/06, 4/14*
U.S. Cl. 83—751 17 Claims



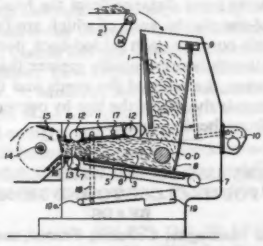
A method of and apparatus for slicing a cut of meat or other food product into a plurality of slices of desired thicknesses simultaneously. A cut of meat is placed on a cutting block having a pusher element mounted thereon. The cutting block is mounted on a carriage that is reciprocable relative to an elongated cutting head having a plurality of transversely spacing cutting blades which is mounted on a frame in overlying relation to the carriage. Means are provided for advancing the carriage and thereby the cut of meat through the cutting blades to slice the meat into a plurality of slices of predetermined thickness.

3,709,274

METHOD AND APPARATUS FOR REGULATING OUTPUT IN TOBACCO CUTTING MACHINES

Josef Marek, and Gunther Hayn, both of Vienna, Austria, assignors to Austria Tabak Werke Aktiengesellschaft, Vienna, Austria

Filed July 13, 1970, Ser. No. 54,357
Claims priority, application Austria, July 14, 1969, A 6769/69
Int. Cl. A01d *55/18*
U.S. Cl. 83—13 25 Claims



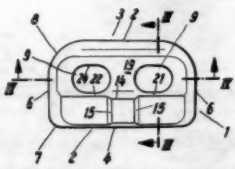
The cut output of a tobacco cutting machine is regulated by measuring the density of the tobacco flowing in the feed channel adjacent the cutting knives. The measurements are taken either directly in the feed channel or proximately upstream thereof, and applied to a control system to regulate the tobacco input to the machine. Apparatus for effecting the density measurement may include radiation absorption measuring instruments.

3,709,275

WEB LINK FOR TIRE CHAINS

Anton Muller, Unterkochen, Germany, assignor to Pistor-Kette GmbH, Wuppertal-Cronenberg, Germany

Filed Sept. 28, 1970, Ser. No. 75,926
Claims priority, application Germany, Sept. 26, 1969, P 19 48 717.3
Int. Cl. B60c 27/04
U.S. Cl. 152—243 14 Claims



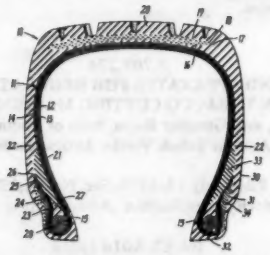
A web link for antiskid tire chains which has a web on the tire side and a web on the road side. The web on the road side has lateral extensions which increase the running surface of the link and stabilize the link in operation. The extensions are preferably midway along the link and recesses may be provided on each side of the extensions to improve the traction of the link.

3,709,276

BEAD AREA CARCASS CORD ARRANGEMENT FOR RADIAL TIRES

Jean Bernard Montague, Cebazat, France, assignor to Compagnie Generale des Etablissements Michelin, raison Sociale Michelin & Cie, Clermont-Ferrand, France

Filed Dec. 18, 1970, Ser. No. 99,370
Claims priority, application France, Dec. 23, 1969, 6944775
Int. Cl. B60c 9/04
U.S. Cl. 152—362 6 Claims



A radial pneumatic tire comprises one or more carcass plies the cords of which are folded back around steel bead wires and terminate at some distance from the bead wires. At least in the case of the ply the ends of which are farthest from the bead wires, the cords in each folded-back portion are curved so that their length is substantially greater than the minimum distance between the ends of the cords and the closest bead wire. This extends the life of the tire by preventing separation of the cords from the tire elastomer.

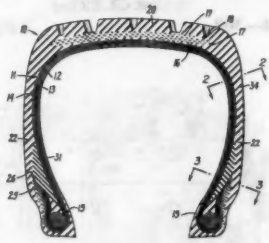
3,709,277

ELASTOMERS ASSOCIATED WITH CORDS OF RADIAL TIRES AT POINTS CLOSE TO AND REMOVED FROM BEADS

Jean Bernard Montagne, Cebazat, France, assignor to Compagnie Generale Des Etablissements Michelin, raison Sociale Michelin & Cie, Clermont-Ferrand (Puy-de-Dome), France

Filed Dec. 18, 1970, Ser. No. 99,371
Claims priority, application France, Dec. 23, 1969, 6944776
Int. Cl. B60c 9/02
U.S. Cl. 152—374 4 Claims

A radial pneumatic tire comprises at least one carcass ply formed of cords. Adjacent to the tire tread, the cords are calendered in an elastomer of a first grade and spaced apart from one another by an elastomer of a second grade. Adjacent to the tire beads, the cords are calendered in and spaced apart by the same elastomer. The calendering and spacing elastomer employed for the cords adjacent to the beads is the same as the calendering elastomer employed for the cords adjacent to the tread.

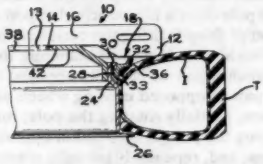


3,709,278

RETAINER FOR MOUNTING TRUCK TIRES

George W. Comer, P.O. Box 72, White Pine, Calif.

Filed May 21, 1971, Ser. No. 145,713
Int. Cl. B60c 25/00
U.S. Cl. 157—1 7 Claims



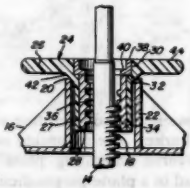
A retainer bar for securing the lock ring used on truck wheels having tube type tires includes a notch for removably attaching the retainer bar to the truck wheel and an elongated portion for overlying the lock ring to hold it in place during inflation of the tire.

3,709,279

TIRE CHANGING MACHINE ADAPTER

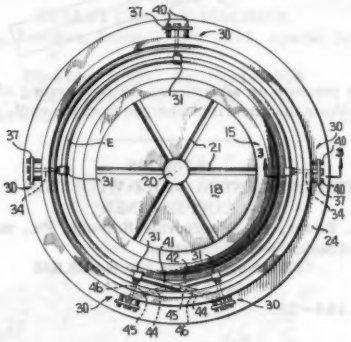
Clayton E. Beaman, P.O. Box 371, Wilson, N.C.

Filed Aug. 5, 1971, Ser. No. 169,361
Int. Cl. B60c 25/06
U.S. Cl. 157—1.24 7 Claims



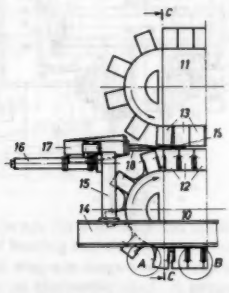
A hand wheel shaped body including a central tubular hub portion projecting endwise outwardly from one side thereof and provided with internal threads for threaded engagement with the abbreviated threads on the hold-down post of a tire changing machine.

3,709,280
METHOD OF MANUFACTURING A CONDUCTION HEATER
Kenneth T. MacMillan, Macon, Ga., assignor to MacMillan Mold Company, Inc., Macon, Ga.
Filed Sept. 18, 1970, Ser. No. 73,509
Int. Cl. B22d 19/00
U.S. Cl. 164—112 19 Claims



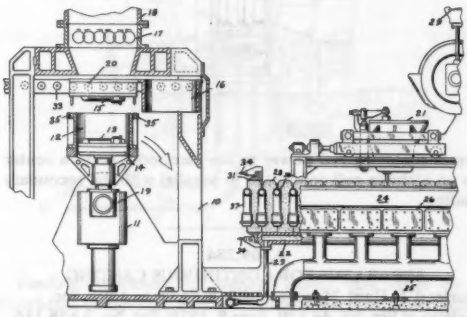
A conduction heater preferably formed as an annular matrix or heater plate for tire recapping and vulcanizing equipment. The heater or matrix is formed by positioning a generally circular hollow tube within an annular cavity, supporting the circular element for sliding movement relative to the cavity, filling the cavity with molten metal, and solidifying the molten metal whereby the relative sliding movement prevents the circular element from rupturing during manufacture and use due to different coefficients of expansion of the material from which the circular element is constructed and the molten metal forming the matrix body upon the solidification thereof. In further accordance with the present method, ends of the circular element are closed by plugs disposed tangentially of the annular cavity whereby upon the solidification of the molten metal and the removal of the plugs thereafter, the ends of the circular element are accessible through tangential voids in a peripheral surface portion of the matrix whereby steam and/or electrical fitments may be secured to the exposed ends of the circular element.

3,709,281
MACHINE WITH HORIZONTALLY OR INCLINED DISPOSED CATERPILLAR MOLD FOR THE DOWNWARD CASTING OF NON-FERROUS METALS
Martin Bolliger, Muraz, Switzerland, assignor to Prolizenz AG, Chur, Switzerland
Filed July 1, 1971, Ser. No. 158,845
Claims priority, application Switzerland, July 3, 1970, 10077/70
Int. Cl. B22d 11/06
U.S. Cl. 164—153 4 Claims



In a machine with horizontally or inclined disposed caterpillar mold for the downward casting of non-ferrous metals drain traps are secured between the mold halves of the lower caterpillar chain in order to prevent damages caused by molten metal flowing out accidentally between opposite mold halves.

3,709,282
MOLDING MACHINE
Russell W. Taccone, Erie, Pa., assignor to Banger Punta Operations, Inc., New York, N.Y.
Continuation of Ser. No. 687,750, Dec. 4, 1967, abandoned.
This application Sept. 21, 1970, Ser. No. 74,161
Int. Cl. B22c 15/08
U.S. Cl. 164—187 19 Claims

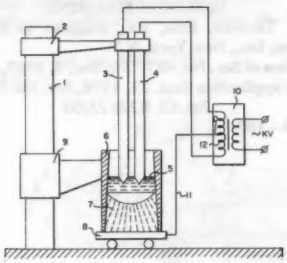


A molding machine for making sand molds includes means for vertically filling and squeezing a sand mold between pattern plates which enclose the ends of a molding flask. After mold formation the flask is tilted from the vertical to the horizontal for pushing the mold horizontally out of the flask onto a receiving conveyor for the metal pouring operation.

3,709,283
MULTIPLE ELECTRODE ELECTROSLAG CASTING APPARATUS HAVING CURRENT EQUALIZER
Boris Evgenievich Paton, ul. Kotsjubinskogo, 9, kv. 21, Kiev; Vladimir Konstantinovich Lebedev, ul. Engelsa, 25, kv. 12, Kiev; Boris Izrailevich Medovar, Bulvar Lesi Ukrainki, 2, kv. 8, Kiev; Jury Vadimovich Latash, Vozdukhoflotsky prospekt, 87, kv. 14, Kiev; Oleg Petrovich Bondarenko, ul. Kreschatik, 15, kv. 34, Kiev; Vitaly Mikhailovich Baglai, ul. Semashko, 10, kv. 54/3, Kiev; Mikhail Nikolaevich Sidorenko, ul. Vladimirskaya, 98, kv. 54, Kiev; Semen Abramovich Leibenzon, Prospekt Lenina, 185, kv. 36; Gary Petrovich Kaganovsky, ul. Patrioticheskaya, 48, kv. 71, both of Zaporozhie; Andrei Pavlovich Altgauzen, Novye Kuzminki, Zhigulevskaya, 4, kv. 27, Moscow; Leonid Evgenievich Nikolsky, Golianovo, korpus 18v, kv. 65, Moscow; Zoya Alexandrovna Gorynina, Donskaya ul., 21, kv. 49, Moscow; Ljudmila Andreevna Safronova, 2 Sinichkina ul., 3a/3, kv. 18, Moscow; Leonid Savvich Katsevich, Sirenevy bulvar, 47, kv. 69, Moscow; Lev Avramovich Volokhonsky, Mytnaya ul., 50-a, kv. 7, Moscow; Alexandr Alexandrovich Nikulin, Znamenskaya ul., 37, kv. 2, Moscow; Vladimir Dmitrievich Artemiev, Leningradsky prospekt, 14, kv. 254, Moscow; Vladimir Mikhailovich Edensky, Cherkizovo-2, B. Tarasovskaya, 108, kv. 69, Moskovskava obl., and Georgy Alexandrovich Voronin, ul. Kazakova, 29, kv. 66, Moscow, all of U.S.S.R.
Continuation of Ser. No. 676,873, Oct. 20, 1967, abandoned.
This application Sept. 28, 1970, Ser. No. 76,205
Int. Cl. B22d 27/02
U.S. Cl. 164—252 31 Claims

In an electroslag remelting installation, a pair of consumable electrodes are immersed into molten slag bath in a mold for forming an ingot. AC power is applied between the electrodes to cause AC current to flow through the molten slag bath, thus causing the electrodes to melt. As the electrodes

melt, they feed simultaneously together into the slag bath. A conductor is connected between the bottom plate of the mold and either a center tap on the secondary winding of the transformer supplying AC power to the electrodes or to a center tap on a choke coil connected in parallel with the secondary winding.



3,709,284

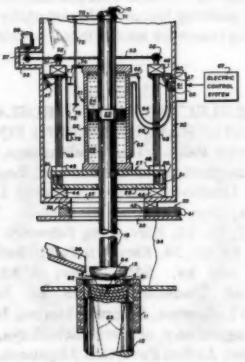
APPARATUS FOR CONTINUOUS CASTING

Charles d'A. Hunt, Moraga, Calif., assignor to Airco, Inc.

Division of Ser. No. 44,130, June 8, 1970, Pat. No. 3,658,116. This application Nov. 19, 1971, Ser. No. 200,625

Int. Cl. B22d *11/10*

U.S. Cl. 164—281 **5 Claims**



Apparatus is described for continuously casting an ingot wherein a cooled plug is repeatedly brought into contact with the top of the ingot during the continuous casting process to remove heat from the central region of the ingot.

3,709,285

METHOD AND APPARATUS FOR GUIDING A CONTINUOUS CASTING STRAND

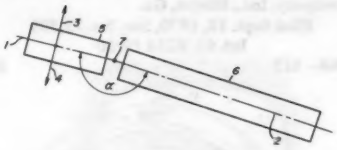
Franz Ruckstuhl, Schwerzenbach, Switzerland, assignor to Erik Olsson A.G., Zurich, Switzerland

Continuation-in-part of Ser. No. 841,833, July 15, 1969, abandoned. This application Sept. 16, 1970, Ser. No. 72,782

Int. Cl. B22d *11/02*

U.S. Cl. 164—282 **13 Claims**

A method and apparatus for continuous casting is disclosed wherein steps and means are provided for overcoming the tendency of a casting formed on an inclined or horizontal plane to have a thicker lower side because of the force of gravity acting on the casting. The casting formed by virtue of the invention is caused to be urged away from the lower surface of the chill or mold such that the influence of gravity is counteracted and the casting contacts the walls of the mold with substantially uniform pressure on all surfaces. Thus, a casting of substantially uniform thickness is discharged from the chill.



3,709,286

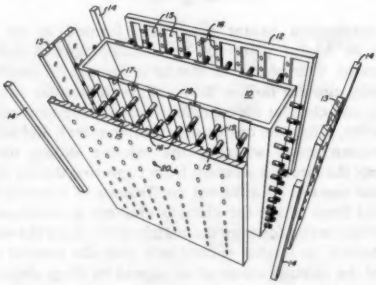
CONTINUOUS-CASTING MOLD WITH THIN-WALLED COPPER LINER

John E. Bower, Jr., Monroeville Borough, Pa., assignor to United States Steel Corporation

Filed Nov. 2, 1970, Ser. No. 85,848

Int. Cl. B22d *11/02*

U.S. Cl. 164—283 **5 Claims**



A continuous-casting mold in which the steel backing plates are fastened to the copper liner with studs welded to the liner. The welded construction enables a thinner-walled liner to be used and affords better resistance against heat distortion and thermal stresses. The studs may be welded directly to the liner or to stainless steel strips which in turn are welded to the liner.

3,709,287

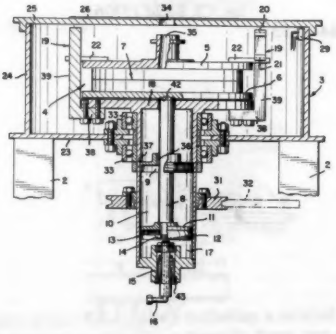
CENTRIFUGAL CASTING MACHINE

Ivan Klobas, 70 Pitt Street, New York, N.Y.

Filed Feb. 17, 1971, Ser. No. 115,997

Int. Cl. B22d *13/10*

U.S. Cl. 164—292 **9 Claims**



The present disclosure relates to a casting machine, more particularly a centrifugal casting machine. The machine util-

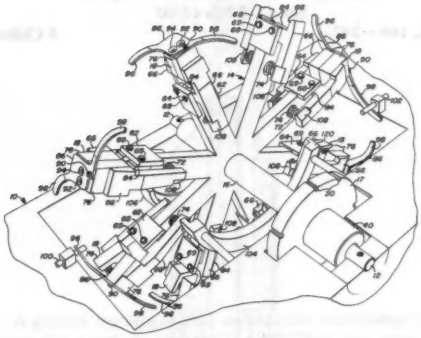
izes a casting head which clamps a mold in place. The mold is maintained in position by virtue of air pressure which acts upon the pressure plate of the casting head. The casting cycle may be automatically set as desired and the air pressure may also be set so as to maintain a constant and uniform value during the casting cycle.

3,709,288

BULLET CASTING MACHINE

William L. Lemieux, Route 2, Box 3013, Apache Junction, Ariz.

Filed May 5, 1971, Ser. No. 140,358
Int. Cl. B22d *29/00, 39/00, 33/02*
U.S. Cl. 164—325 **2 Claims**



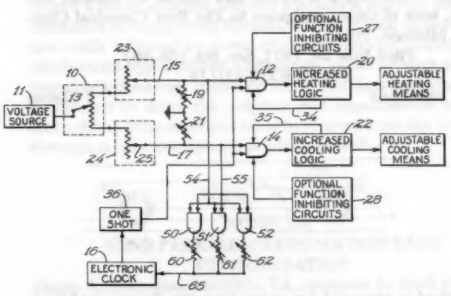
A bullet casting machine wherein a rotary mold carrying means supports a plurality of normally closed separable molds; cam operated means for automatically opening said molds, said molds being provided with cam operated gate means intermittently adapted to receive molten metal from a metal container and dispenser; valve means disposed to dispense metal from said container; and intermittent means for rotating said mold carrying means successively to align said molds with an outlet for said valve means and concurrently to operate said valve means.

3,709,289

HEATING AND COOLING CONTROL SYSTEM

Richard N. Weatherston, Saint Paul, Minn., assignor to Weather-Rite, Inc., St. Paul, Minn.

Filed March 30, 1971, Ser. No. 129,506
Int. Cl. F25b *29/00*
U.S. Cl. 165—12 **7 Claims**



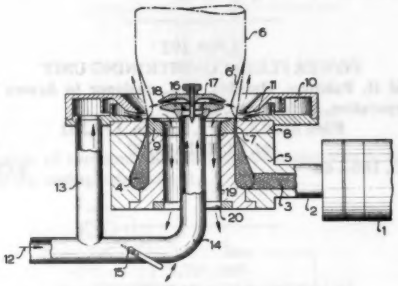
A control system for a heating and cooling system in which the amount of heating and the amount of cooling are changed in incremental stages in response to a signal received at timed intervals from an electronic clock. A proportional thermostat calls for either heating or cooling and also controls the rate of the electronic clock.

3,709,290

COOLING EQUIPMENT FOR TUBULAR PLASTICS FILM MADE BY A BLOWHEAD

Hartmut Upmeier, Tecklenburg, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Dec. 4, 1970, Ser. No. 95,025
Claims priority, application Germany, Dec. 4, 1969, P 19 60 962.2; Feb. 24, 1970, P 20 08 597.6
Int. Cl. F24h *3/60*
U.S. Cl. 161—47 **6 Claims**



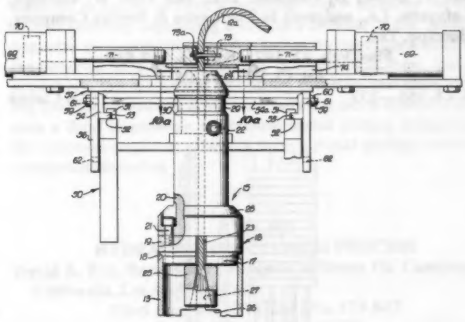
Cooling equipment for tubular plastic film made by a blowhead, comprising an external air cooling ring for mounting between the blowhead and a position where the film has solidified, the air outlet from said external ring being directed onto the outside of the tubular film, a supply conduit and a withdrawal conduit, both extending axially through the blowhead, for the passage of internal cooling air, and an annular nozzle at the outlet of the supply conduit, the outlet of said nozzle being directed onto the interior surface of the film in such a way that the interior and exterior streams of cooling air impinge on the film at substantially the same level.

3,709,291

METHOD AND APPARATUS FOR REESTABLISHING UNDERWATER GUIDE LINES

James W. E. Hanes, 2924 Sailor Avenue, Ventura, Calif.; Michael J. Rimmer, 62, Stubbs End Close, Amersham/Bucks, England; Ronald A. Weber, 2068 Los Encinos Road, Ojai, Calif., and Walter J. Hintzen, 911 Vincente Way, Santa Barbara, Calif.

Filed Aug. 31, 1970, Ser. No. 68,062
Int. Cl. E21b *7/12*
U.S. Cl. 166—.5 **47 Claims**



To replace a broken underwater guide line or cable extending from a guide post, at a well bore location, to a floating drilling vessel, a remotely operable apparatus is lowered along one or more intact guide lines and accurately positioned to cut off the disrupted line at the top of the guide post, whereupon a replacement intact guide line is attached to a connector car-

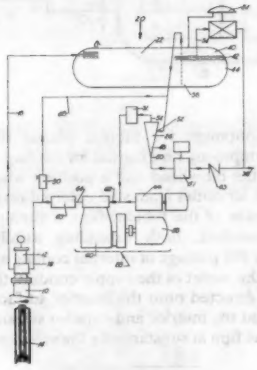
ried by a remotely operable apparatus, and lowered through the water to position the connector over the guide post and firmly secure it thereto, the apparatus being released from the underwater connector and withdrawn. If the line secured to the connector breaks, such line can be severed at the top of the connector and the connector withdrawn to the drilling vessel, a replacement intact line being secured to the connector, or a substitute therefor, which are lowered to the guide post and secured thereto. At any time, the connector with an intact line attached thereto can be released from the guide post and withdrawn to the drilling vessel.

3,709,292

POWER FLUID CONDITIONING UNIT

Harold H. Palmour, Humble, Tex., assignor to Armco Steel Corporation, Middletown, Ohio

Filed April 8, 1971, Ser. No. 132,361
Int. Cl. E21b *43/00*
U.S. Cl. 166—68 **9 Claims**



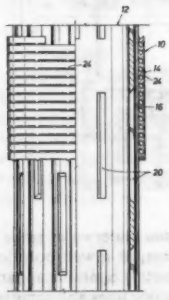
A one well, self contained, wide producing range, hydraulic pumping system comprising a power fluid conditioning unit to condition produced water, oil, or a mixture of oil and water, from the produced well fluids and exhausted power fluid so that it will be suitable for use as power fluid to economically pump a well which produces medium to large volumes from average to greater depths of lift.

3,709,293

WIRE WRAPPED WELL SCREEN

Leslie A. Layne, II, Houston, Tex., and Fred W. Gerwick, Lafayette, La., assignors to The Layne & Bowler Company, Houston, Tex.

Filed Feb. 22, 1971, Ser. No. 117,555
Int. Cl. E21b *43/08*
U.S. Cl. 166—232 **6 Claims**



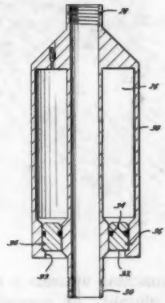
A well screen in which wire having accurately formed spacing lugs therein is helically wrapped around a tubular pipe having concave arcuate grooves longitudinally formed in the outer surface thereof and either through slots or perforations intersecting the grooves at the point of deepest penetration thereof to produce a funnel effect. In addition to the more conventional keystone wire, there is further disclosed two subspecies of wire having a cross-section including a concave arcuate, preferably semicircular, segment to increase the transverse flow area between windings and enhance the circumferential flow.

3,709,294

DOWNHOLE POWER DISSIPATOR

Marion D. Kilgore, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed April 16, 1971, Ser. No. 134,676
Int. Cl. E21b *43/00*
U.S. Cl. 166—243 **8 Claims**



A downhole power dissipator for protecting a packer in a casing in a well bore from a sudden increase in pressure by providing a closed collapsible chamber positioned adjacent the packer and preferably between the packer and the point of pressure increase. Said chamber includes a compressible gas and means allowing the gas in the chamber to become compressed when the chamber is subjected to a predetermined external increase in pressure. The chamber is attached to the packer whereby the chamber is retrievable from the well bore and said chamber including a passageway for passage of well equipment.

3,709,295

FRACTURING OF SUBTERRANEAN FORMATIONS

Frank H. Braunlich, Jr., Tulsa, and Milton L. Bishop, Edmond, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

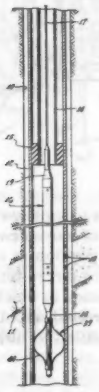
Filed June 24, 1971, Ser. No. 156,402
Int. Cl. E21b *43/119*
U.S. Cl. 166—245 **7 Claims**

A method is provided for controlling the direction of fractures produced in a subterranean formation. In this method three wells drilled in a substantially straight line are simultaneously subjected to hydraulic fracturing. First, a fracturing fluid is continuously injected into the two outside wells and while continuing said introduction, fracturing fluid is then injected into the center well until fractures while lie in a plane which is crosswise to the line of the three wells are produced.

3,709,296
WELL BORE ZONE PLUGGING METHOD AND APPARATUS

James J. Glenn, Jr., Long Beach, Calif., assignor to Triangle Service Inc., Long Beach, Calif.

Filed Jan. 11, 1971, Ser. No. 105,481
Int. Cl. E21b *33/132, 33/138*
U.S. Cl. 166—253 25 Claims



A gamma ray logging tool and a bailer containing a catalyst or curing agent are lowered in a bore hole to a zone therein having a permeability which is to be decreased. A liquid plastic is pumped into the bore hole to the zone, the plastic containing a radioactive tracer detected by the logging tool when the plastic arrives at the zone, whereupon the catalyst is discharged from the bailer and mixed with the liquid plastic, the mixture then being displaced into the zone where it hardens.

3,709,297
PETROLEUM RECOVERY PROCESS

Charles A. Christopher, Jr.; Henry J. Grimm, and Alton J. Nute, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 102,134
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 21 Claims

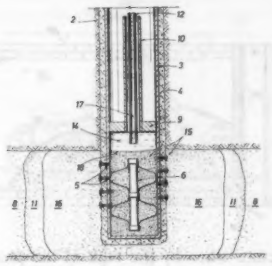
An improved oil recovery method is disclosed in which a slug of a dilute aqueous polymer solution is injected into a subterranean oil-containing formation through one or more injection wells followed by a slug of dilute aqueous solution of an alkali metal hypochlorite. Optionally, either or both of the injected solutions may contain a surfactant. In a final step, water is injected to drive the polymer and hypochlorite solutions through the formation and oil is recovered from the formation through at least one spaced production well.

3,709,298
SAND PACK-AIDED FORMATION SAND CONSOLIDATION

James A. Pramann, Metairie, La., assignor to Shell Oil Company, New York, N.Y.

Filed May 20, 1971, Ser. No. 145,149
Int. Cl. E21b *43/02, 33/138*
U.S. Cl. 166—276 5 Claims

In treating a cased and perforated well to prevent sand inflow, a resin solution from which self-curing epoxy resin is subsequently precipitated is injected into the reservoir and the perforated interval of the casing is filled with grains suspended in and permeated with the resin solution. The resin is allowed to precipitate and cure in the casing and reservoir and at l east

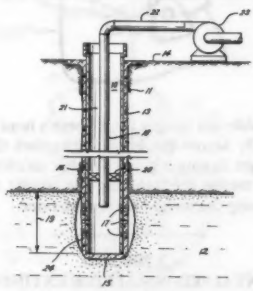


a portion of the consolidated mass of grains that is formed within the casing is drilled-out.

3,709,299
PLATING EXPANDED BOREHOLES

George O. Suman, Jr.; Carey Epps Murphey, Jr.; Edwin Allen Richardson, and Robert Steven Torrest, all of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed Jan. 7, 1971, Ser. No. 104,695
Int. Cl. E21b *33/138, 43/02*
U.S. Cl. 166—278 6 Claims



A well treatment method for consolidating an incompetent material in and/or around a borehole which includes the steps of hydraulically expanding a selected interval of the borehole opposite an unconsolidated formation by injecting a fluid into the interval at a fluid injection pressure less than, but approaching, the formation fracturing pressure and then injecting into the formation at substantially the same injection pressure a fluid containing electroless metal plating components the reaction products of which form a metal plating on the incompetent material.

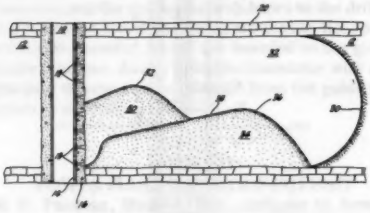
3,709,300
HYDRAULIC FRACTURING PROCESS

David S. Pye, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 27, 1971, Ser. No. 175,643
Int. Cl. E21b *43/26, 43/27*
U.S. Cl. 166—280 24 Claims

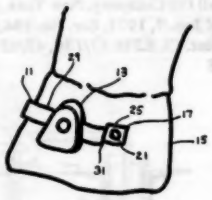
A process for hydraulically fracturing a permeable subterranean formation in which the fracture faces are treated to reduce their permeability to the fracturing fluid and propping agent is placed in the fracture in a conventional manner whereby the bulk of the propping agent is deposited in the fracture at a location remote from the well, and thereafter the

fracture faces are treated to restore their permeability to subsequently injected fluids and propping agent is again injected



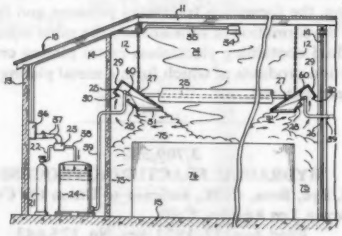
into the fracture whereby the bulk of the propping agent is deposited in the fracture adjacent to the well. In this manner, fluid conductively through the fracture is assured.

3,709,301
ADJUSTABLE TOE WEIGHT FOR HORSES
Richard L. Hall, 2888 E. Pleasant Avenue, Eden, N.Y.
Filed Feb. 11, 1971, Ser. No. 114,650
Int. Cl. A01l *07/00*
U.S. Cl. 168—25 **7 Claims**



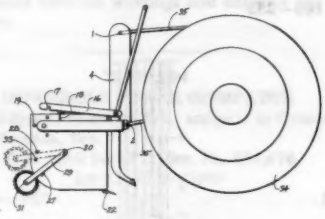
In an adjustable toe weight for a horse's hoof, a band which extends laterally across the hoof is attached thereto at each end and a weight having a guide slot for receiving the band is provided with means for fastening the weight to the band to permit positioning the weight across the hoof.

3,709,302
SELF-CONTAINED FOAM FIRE EXTINGUISHING SYSTEM
Howard C. Stults, 7630 South Bright, Whittier, Calif.
Continuation-in-part of Ser. No. 782,343, Dec. 9, 1960, Pat. No. 3,592,269. This application July 8, 1971, Ser. No. 160,810
Int. Cl. A62c *3/08*
U.S. Cl. 169—9 **15 Claims**



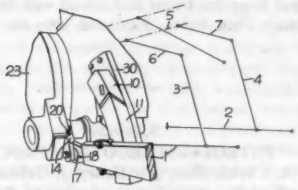
A self-contained high expansion foam fire extinguishing system providing an independent source of pressurization to a container holding a mixture of water and foam concentrate for delivery to a foam generator having a plurality of nozzle members and a stratified screen to produce high expansion foam upon activation of the system by a fire detecting sensor.

3,709,303
PLOW RAKE
Hugh W. Richards, 850 Cedar Street, Carrollton, Ga.
Filed Sept. 1, 1971, Ser. No. 176,857
Int. Cl. A01d *15/02*
U.S. Cl. 171—86 **11 Claims**



This disclosure relates to a plow rake for landscaping purposes which is capable of movement to three different positions wherein, in a first position, it can pick up rocks, sticks, and trash while permitting dirt to filter through and back into the ground, a second position in which a long, transverse blade is caused to scrape the ground smooth, and a third position in which plow points are caused to turn the ground being landscaped.

3,709,304
SWAY ARRESTOR FOR A THREE POINT HITCH
Robert C. Haupt, Milwaukee, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Dec. 28, 1970, Ser. No. 101,814
Int. Cl. A01b *59/043*
U.S. Cl. 172—450 **10 Claims**



A three point hitch sway arrestor for limiting the lateral sway of the lower draft arms when they are disconnected from an implement and raised to the transport position on the tractor.

ERRATUM

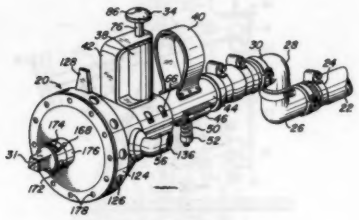
For Class 173—44 see:
Patent No. 3,709,097

3,709,305
CONTROLLED REACTION UNDERWATER POWER TOOL
Harmon F. Morress, 7412 Kellogg Avenue, Cincinnati, Ohio
Filed Feb. 11, 1971, Ser. No. 114,477
Int. Cl. F01d *15/06*
U.S. Cl. 173—30 **22 Claims**

Hydraulic media, under pressure is utilized to drive in a torque-free manner, a turbine-type underwater power tool.

Torque reaction nozzles are provided on the tool housing to exhaust pressurized liquid in a direction counterclockwise to the torque generated by the tool driving rotor. Means under control of the operator are provided to regulate the amount of pressurized liquid exhausted through the nozzles. A sling is

also provided on the tool housing related to a hand grip means at such location as to permit an operator to grip the hand grip



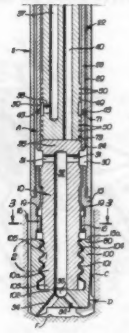
while the sling engages the forearm of the operator for suspension of the tool in proper working position.

3,709,306

THREADED CONNECTOR FOR IMPACT DEVICES

Alfred R. Curington, Houston, Tex., assignor to Baker Oil Tools, Inc., City of Commerce, Calif.

Filed Feb. 16, 1971, Ser. No. 115,571
Int. Cl. E21b *1/06*
U.S. Cl. 173—132 **21 Claims**



An impacting apparatus in which a threaded connection is provided between an anvil and a drill bit connected thereto, a malleable member located between the anvil and bit threads insuring a more uniform load distribution over the thread surfaces, the blows on the anvil being transmitted directly to the bit without passing through the malleable member.

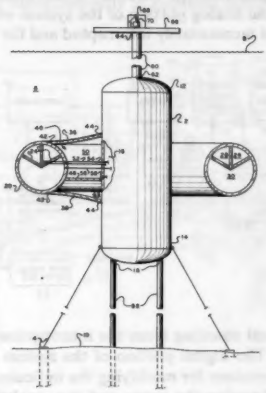
3,709,307

UNDERWATER DRILLING AND PRODUCTION VESSEL

Ernest E. Clark, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Oct. 5, 1970, Ser. No. 78,118
Int. Cl. E21b *15/02*
U.S. Cl. 175—8 **12 Claims**

An elongated housing having a fluid tank extending about its axis is divided into a plurality of housing chamber portions by decks extending therethrough, is maintained in a substantially vertical position spaced preselected distances from the top and bottom surfaces of a body of water and has a conduit



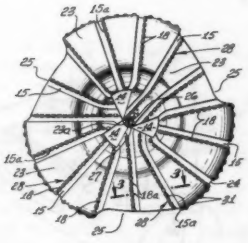
extending from the chamber of the vessel upwardly to a position above the top surface of the water.

3,709,308

DIAMOND DRILL BITS

David S. Rowley, and Charles E. Ward, both of Salt Lake City, Utah, assignors to Christensen Diamond Products Company, Salt Lake City, Utah

Filed Dec. 2, 1970, Ser. No. 94,399
Int. Cl. E21b *9/36*
U.S. Cl. 175—329 **22 Claims**



Diamond drill bits for drilling oil, gas, water, mining, and similar, bore holes in formations, in which cube diamonds are set in the drilling face of a bit with the diamonds arranged in generally radial rows and with the leading or cutting faces of the diamonds also arranged generally radially to enhance cutting of certain formations, such as relatively soft or evaporite formations. The leading faces of the rows of diamonds form the trailing sides of fluid waterways or channels through which drilling fluid flows. In some forms of bits, conventional generally round rows of diamonds are used in conjunction with the cube diamonds to limit the depth of penetration of the cube diamonds into the formation.

3,709,309

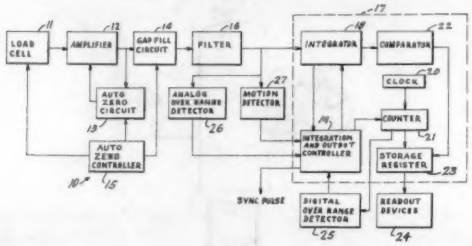
ELECTRONIC WEIGHING SYSTEM WITH DIGITAL READOUT

Roger B. Williams, Jr., Sylvania; Richard C. Loshbough, Toledo, and Stanley A. Deitemeyer, Sylvania, all of Ohio, assignors to Reliance Electric Company, Toledo, Ohio

Filed Sept. 30, 1971, Ser. No. 185,045
Int. Cl. G01g *13/14, 3/14*
U.S. Cl. 177—165 **11 Claims**

An improved electronic weighing system with a digital readout. A transducer establishes an analog signal cor-

responding to an unknown weight. The analog signal is amplified, digitized with an analog-to-digital converter and applied to the digital readout. Circuitry is provided for automatically zeroing the analog portion of the system while the transducer output is momentarily interrupted and for filling gaps in



the analog signal resulting from the interruption of the transducer output. The digital portion of the system also includes tare weight provisions for modifying the indicated weight, and circuitry for changing the range and the resolution or increment of the weighing system.

3,709,310

LOAD INDICATING APPARATUS WITH HYSTERESIS CORRECTION

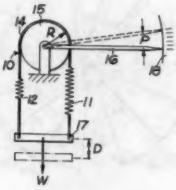
Geoffrey Cyril Cooke, Stourbridge, and John Anthony Gamble, Handsworth, both of England, assignors to W & T Avery Limited, Birmingham, England

Filed Aug. 17, 1970, Ser. No. 64,503

Claims priority, application Great Britain, Aug. 21, 1969, 41,758/69

Int. Cl. G01g *23/14*

U.S. Cl. 177—168 **15 Claims**



Load indicating apparatus for weighing or testing in which errors otherwise inherent due to mechanical hysteresis are compensated by applying a hysteresis characteristic of a secondary resistant. A difference in hysteresis characteristic of like sign, e.g. positive, of two resistants may be taken in which case the resistants used may be springs or pendulums; or a sum of hysteresis characteristics of unlike sign, i.e. positive and negative, may be taken in which case one resistant may be a flexure strip and the secondary resistant with negative characteristics may be a strain gauge bonded thereto.

3,709,311

TOP-LOADING BALANCE

Max K. Appius, Berneck, Switzerland, assignor to Mettler Instrumente AG, Greifensee-Zurich, Switzerland

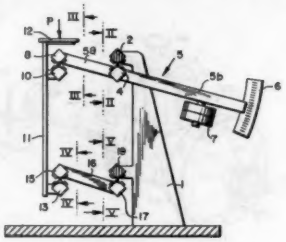
Filed May 28, 1971, Ser. No. 147,803

Claims priority, application Switzerland, June 1, 1970, 8185/70

Int. Cl. G01g *1/34*

U.S. Cl. 177—203 **7 Claims**

The parallelogram linkage of a top-loading balance which maintains the positions of the weighing pan parallel during pivoting movement of the balance beam includes the beam, a portion of the stationary support structure, and two guide members, which are connected by band hinges. The major dimensions of each band in the two hinges on the ends of the guide member parallel to the balance beam are located in one of two intersecting planes in a certain angular position of the guide member and the connected other linkage member. Only



the major dimensions of one band are located in one of the planes, thereby reducing the torsional stiffness of the parallelogram linkage and minimizing the effect of the linkage on the weight response of the balance.

3,709,312

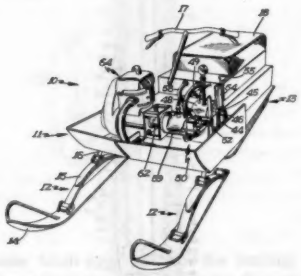
SNOWMOBILE WITH HYDRAULIC DEVICE

Gregory J. McGough, Saint Paul, Minn., assignor to Richard H. Fox, Roseville; Charles Grui; Peter J. McGough, both of St. Paul; Vincent Nonnemacher, Newport; Gary R. Schwartz; Frederick H. Valencour, both of St. Paul and John M. Vieman, Roseville, all of, Minn., part interest to each

Filed Aug. 27, 1970, Ser. No. 67,466

Int. Cl. B62m *27/02*

U.S. Cl. 180—5 R **5 Claims**



A snowmobile includes an internal combustion engine drivingly connected to the variable displacement rotary pump. The pump is disposed in controlling relation with respect to a variable displacement reversible rotary motor whose output shaft drives the chain and sprocket drive to the bogey wheel assembly. A control valve is provided and permits the rotary motor to be driven selectively in a reverse or forward direction, and also permits the flow of hydraulic fluid to bypass the motor when the valve is in a neutral position. The bogey wheel assembly includes a frame supporting the bogey wheels which assembly may be readily removed and replaced as a unit from the snowmobile body thereby facilitating maintenance of the bogey wheel assembly.

3,709,313

ARTICULATED VEHICLE

Jack C. James, Long Beach, Calif., assignor to Walt Disney Productions, Burbank, Calif.

Filed Jan. 21, 1971, Ser. No. 108,481

Int. Cl. B62d *39/00*

U.S. Cl. 180—21 **5 Claims**

An articulated vehicle including a frame having front and rear frame portions connected together on their adjacent sides

by transversely extending pivot means. A pair of main wheels carry the pivot means and front and rear castor wheels carry the front and rear extremities of the respective front and rear frame portions. Control means is provided for driving the

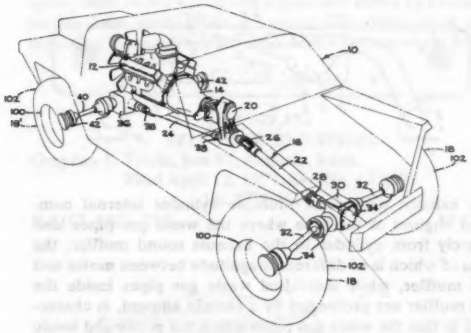
main wheels independently for steering the vehicle whereby such vehicle may be maneuvered in relatively restricted areas and articulation of such frame will enable the castor wheels to shift vertically with respect to the main wheels to accomodate uneven and irregular terrain.

3,709,314

ALL TERRAIN VEHICLE

Victor F. Hickey, Ventura, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Oct. 16, 1970, Ser. No. 81,236
Int. Cl. B60k *17/34*
U.S. Cl. 180—44 R **1 Claim**



A high speed all terrain vehicle of the type having four wheel drive through a limited slip inter-axle differential that is effective to transfer driving torque between a front differential and a rear limited slip differential upon loss of traction of some of the wheels. Improved rough terrain mobility is achieved through an independent torsion bar suspension employing a power augmented roll steer characteristic to reduce the turning radius of the vehicle.

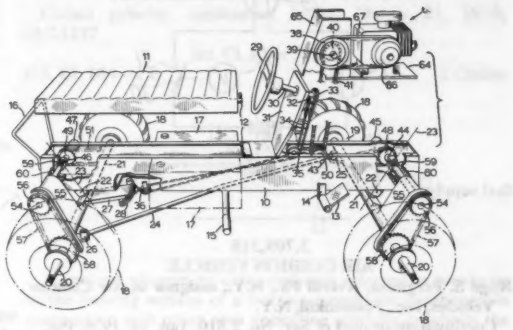
3,709,315

VEHICLE FOUR WHEEL DRIVING AND STEERING ARRANGEMENT

Alfred G. Fisher, 1152 Linbrook Road, Oakville, Ontario, Canada

Filed May 7, 1970, Ser. No. 35,494
Int. Cl. B60k *17/34*
U.S. Cl. 180—50 **10 Claims**

A four wheeled "motor-cycle" type vehicle comprises an elongated body with the motor at the front and a seat at the rear, the driver straddling the body. Two axles carrying the wheels are mounted about steering axes that lie in the same vertical plane and are inclined toward one another, the axles being pivoted simultaneously in opposite directions for steering. Each axle has a respective drive shaft movable therewith and the drive shaft is connected to the motor via a respective driver member, the driver member being connected to the drive shaft via a universal joint located on the respective steering axis.

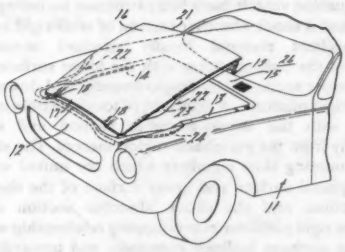


3,709,316

CAM ACTION SAFETY HOOD

Patrick M. Glance, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 26, 1971, Ser. No. 192,454
Int. Cl. B62d *25/10*
U.S. Cl. 180—69 C **10 Claims**



Vehicle hood construction in which the hood in hinged at its front end to the front wall of the vehicle engine compartment and is latched at its rear end to the vehicle cowl structure forming the rear wall of the engine compartment. The side walls of the engine compartment and the longitudinal edges of the hood are provided with cam means comprising complementary coacting ramp or cam surfaces. If the hood is shoved rearwardly under vehicle collision conditions, an upward buckling of the hood is induced by the cam means which has the effect of foreshortening the hood. This acts as an energy absorption device and prevents unlatching of the hood rear edge and subsequent movement of the rear edge toward the vehicle passenger compartment.

3,709,317

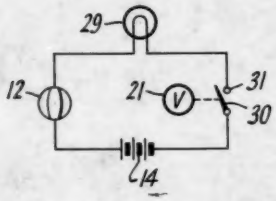
RESERVE FLUID VALVE POSITION INDICATOR

John W. Ingham, Jr., Wauwatosa, Wis., assignor to AMF Incorporated

Filed Oct. 1, 1970, Ser. No. 77,134
Int. Cl. B60q *9/00*, *1/00*
U.S. Cl. 180—103 **1 Claim**

An indicator light which is operated by the reserve fuel

valve indicates when the motorcycle is operating on its reserve fuel supply.



3,709,318

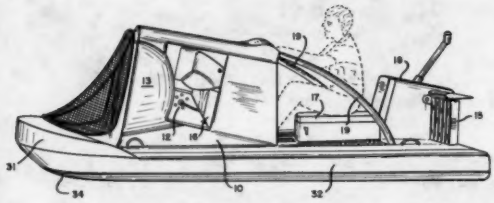
AIR CUSHION VEHICLE

Hugo S. Ferguson, Averill Pk., N.Y., assignor to Air Cushion Vehicles, Inc., Poestenkill, N.Y.

Continuation-in-part of Ser. No. 2,810, Jan. 14, 1970, Pat. No. 3,608,662. This application June 30, 1971, Ser. No. 158, 284

Int. Cl. B60v *1/00*

U.S. Cl. 180—116 14 Claims



An air-cushion vehicle has a body structure including a rigid platform, and a shock absorber section of semi-rigid self-supporting resilient material fixedly attached around the periphery of the rigid platform with the lower surface of the shock absorber section extending outwardly and downwardly below the rigid platform. A thin skirt of tough flexible material is united with the shock absorber section and extends downwardly from the peripheral region thereof. The skirt has integral mounting skirt members which are united with the outer peripheral surface and lower surface of the shock absorber section, and the shock absorber section extends beneath the rigid platform in overlapping relationship with the overlapping surfaces inclined outwardly and upwardly from the horizontal. At the front, the lower portion of the shock absorber section slopes upwardly and forwardly. The rigid platform, shock absorber section and skirt comprise a plenum chamber to which air pressure is supplied.

3,709,319

RESONATOR CHAMBER SILENCER FOR GAS TURBINE

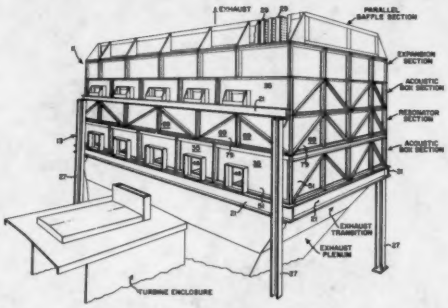
John F. Lawyer, Albany, and David K. Prugger, Rexford, both of N.Y., assignors to General Electric Company

Filed Oct. 6, 1971, Ser. No. 187,090

Int. Cl. B64f *1/26*; E04b *1/82*; F01n *1/10*

U.S. Cl. 181—33 HB 7 Claims

A gas turbine exhaust silencer for attenuating both high-frequency and low-frequency noises. In the low-frequency silencing section there is a row of acoustically absorbent boxes which are spaced apart to form gas passageways between adjacent opposite sidewalls. Some low-frequency noise is absorbed into the acoustic boxes through perforations in the sidewalls. Aligned with the acoustic boxes, there is a row of hollow, spaced apart, resonator boxes contiguous with the acoustic boxes to continue the gas passageways. Additional low-frequency sound attenuation is provided by the resonator boxes wherein adjacent opposite sidewalls defining the gas passageways have a plurality of openings therein through which sound waves may pass to be reflected off interior walls of the resonator to cancel incoming sound waves.



3,709,320

EXHAUST MEANS FOR MULTIPLE CYLINDER INTERNAL COMBUSTION ENGINE

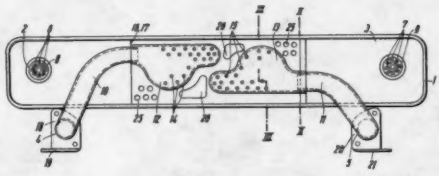
Alois Hollerl, and Karl Landgraf, both of Schoensee, Germany, assignors to Firma Otto Meinel-Georgadel Metallwarenfabrik, Schoensee/Oberpfalz, Germany

Filed Oct. 12, 1971, Ser. No. 188,413

Claims priority, application Germany, Oct. 15, 1970, G 70 38 137.2

Int. Cl. F01n *7/06, 7/10, 7/18*

U.S. Cl. 181—40 8 Claims



The exhaust device for multiple cylinder internal combustion engines of the type where the waste gas pipes lead separately from cylinder to the exhaust sound muffler, the lengths of which is of different magnitude between motor and sound muffler, while individual waste gas pipes inside the sound muffler are prolonged by a certain amount, is characterized in that the waste gas pipes which are prolonged inside the sound muffler have at least one enlargement in their cross-section.

3,709,321

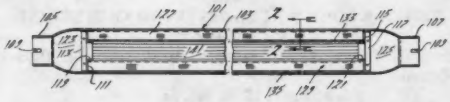
MUFFLER WITH LONGITUDINAL CHAMBER

Wladyslaw F. Malkiewicz, Casa Grande, Ariz., assignor to Tenneco Inc., Racine, Wis.

Filed Aug. 19, 1971, Ser. No. 172,978

Int. Cl. F01n *1/10, 7/16*

U.S. Cl. 181—50 5 Claims



A straight through muffler for removing medium and high frequency sounds in the exhaust system of an internal com-

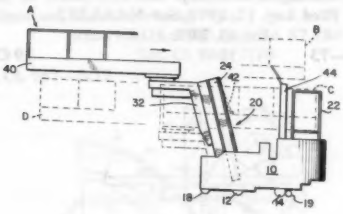
bustion engine includes a straight through gas passage that is formed by a length of wire cloth or the equivalent which is pleated so that the inner diameter of the pleats define the gas passage and the outer diameter fits the housing of the muffler.

3,709,322

OVERHEAD SERVICE APPARATUS WITH SWIVEL PLATFORM

Maurice E. Mitchell, 9 Hickory Road, Muncie, Ind.

Filed Feb. 1, 1971, Ser. No. 111,269
Int. Cl. E04g *1/22*
U.S. Cl. 182—62.5 15 Claims



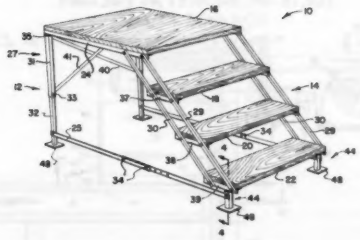
Overhead service apparatus having a telescopically extensible inclined mast, mounted on a mobile base which is operable to swivel the mast about a mast-swivel axis, combined with a platform support on the mast and on which a platform is mounted for both traversing movement and swivel movement. The combined swivel and traverse platform movement at the top of an inclined telescopic mast provides unique versatility for positioning a work platform in elevated positions, parallel to the work surface or zones anywhere in an extensive reach space. Mast swivel movement is provided either by driving the mobile base itself about a central mast-swivel axis, or by mounting the mast on a turntable which swivels on the base.

3,709,323

SELF-LEVELING STRIPS

Graydon E. Trible, Box 97, Augusta, Kans.

Filed April 12, 1971, Ser. No. 133,072
Int. Cl. E06c *1/18*
U.S. Cl. 182—115 10 Claims



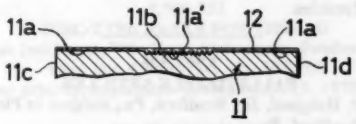
An adjustable height self-leveling set of steps and landing, including a pair of trapezoidal shaped side frames having legs at each corner thereof. The four members making up the side frames are pivotally connected with the exception of one rigid joint between two of the members to prevent the side frame from collapsing. Each corner will self-level by shifting the shape of the side frame while the steps and landing remain substantially horizontal.

3,709,324

PROCESS FOR THE PREVENTION OF UNINTENTIONAL ESCAPEMENT OF AN APPLIED OIL LAYER

Hiroshi Iwasawa, Kawasaki, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed March 23, 1971, Ser. No. 127,101
Claims priority, application Japan, March 23, 1970, 45/24227
Int. Cl. F16c *33/12*
U.S. Cl. 184—1 E 2 Claims



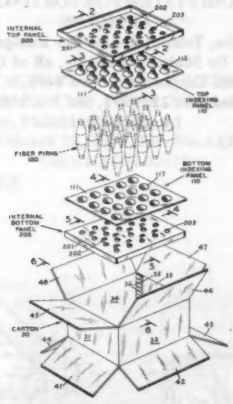
A process wherein an elongated area selected in proximity to the bearing surface of a bearing member is roughened in comparison with other area encircling partially or wholly the bearing surface, an oil-repulsing polymer is applied to the overall surface of said member, said polymer is substantially or wholly removed from other surface area than said roughened surface, and then the member is subjected to thermal influence at an elevated temperature selected lower than the decomposition temperature of said agent thereby the latter being caused to creep around from said roughened area, especially towards the bearing surface.

3,709,325

CASE FOR SHIPPING ARTICLES IN AN UPRIGHT POSITION AND IN SPACED LATERAL SEPARATION

Robert Louis Gordon, Monroe, and John Charles Siegele, Spring Valley, both of N.Y., assignors to International Paper Company, New York, N.Y.

Filed March 16, 1971, Ser. No. 124,774
Int. Cl. B65d *71/00*
U.S. Cl. 206—65 Y 20 Claims



The case comprises wall panels, one or more bottom flaps, a bottom indexing panel containing one or more downwardly projecting female recesses into which the bottom of the packaged article is inserted, an internal bottom panel disposed beneath said bottom indexing panel containing apertures which fit over the periphery of said downwardly projecting female recesses, and means for spacing apart the internal bottom panel and bottom of the case so as to allow the downwardly projecting female recesses to pass through, and be locked in place by, the aperture of the internal bottom panel.

The case further comprises a top indexing panel containing one or more upwardly projecting female recesses into which the top of the packaged article is inserted, an internal top panel disposed above the top indexing panel containing apertures which fit over the periphery of the upwardly projecting female recesses, one or more top flaps, and means for spacing apart the internal top panel and top of the case so as to allow the upwardly projecting female recesses to pass through, and be locked in place by, the apertures of the internal top panel.

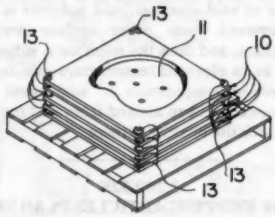
The shipping case can be provided with an article separator layer assembly when the case is used to package a plurality of layers of articles.

3,709,326

PALLETIZABLE ARTICLES

Robert P. Habgood, Jr., Bradford, Pa., assignor to Plexowood Inc., Bradford, Pa.

Filed July 8, 1970, Ser. No. 53,077
Int. Cl. B65d *85/62*
U.S. Cl. 206—65 R 3 Claims



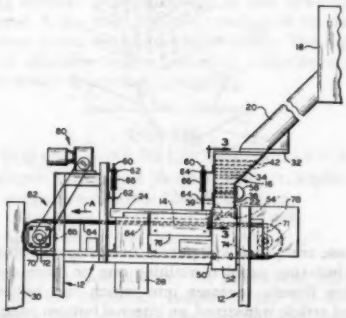
A palletizable article comprised of a molded article having a plurality of seating members molded integral with it for maintaining like molded articles substantially aligned when stacked on said molded article.

3,709,327

METHOD AND SYSTEM FOR SORTING SPHERICAL ARTICLES

Edward Lee Hite, Toledo; Dennis Lee Ramge, Waterville, and Andre Roelf De Muinck, Defiance, all of Ohio, assignors to Johns-Manville Corporation, New York, N.Y.

Filed Jan. 21, 1971, Ser. No. 108,450
Int. Cl. B07b *13/04*
U.S. Cl. 209—73 27 Claims



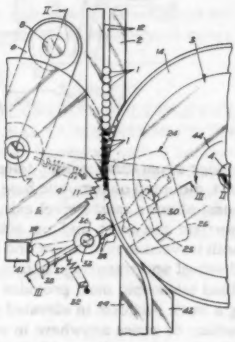
A system and method for sorting spherical articles from a bulk supply of articles is disclosed in a preferred embodiment wherein spheres of a generally uniform size are fed from a bulk supply source to a separator hopper which separates out non-spherical and foreign materials by use of a series of curved equally spaced guides nested in an enclosure whereby over sized foreign materials particularly those of substantial length are restricted and the spherical articles are passed to a metering orifice having as a lower margin a flexible rough surfaced belt driven to transport the passed material to a grading bar. The grading bar is positioned above the belt a distance slightly less than the diameter of the spherical articles to allow under sized and non-rolling material to pass thereunder as the belt travels beneath the grading bar while spherical articles are advanced by engagement with the grading bar in a single file to a collection point.

3,709,328

FASTENER SORTING APPARATUS

Johannes Mohr, Oberboihingen, and Adolf Cast, Oberlenningen, both of Germany, assignors to Karl M. Reich Maschinenfabrik, Nuertingen, Germany

Filed Aug. 12, 1970, Ser. No. 63,252
Int. Cl. B07c *5/10*
U.S. Cl. 209—73 19 Claims



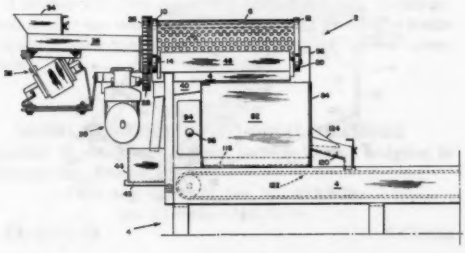
A sorting apparatus for detecting improperly-shaped fasteners, for example, nails, screws or the like, within a row of properly shaped fasteners and segregating and then expelling these improper fasteners from the proper fasteners.

3,709,329

TABLET CLASSIFICATION MACHINE

John J. Mlodzinski, Willow Grove, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed Sept. 30, 1971, Ser. No. 185,141
Int. Cl. B07c *5/04*
U.S. Cl. 209—75 7 Claims



A tablet classification machine has a drum having an inlet end and an outlet end, mounted for rotation and having circular openings having a predetermined diameter to pass tablets having a diameter less than a predetermined diameter and pieces of broken tablets. A tablet supply chute supplies tablets to the inlet end of the drum. A helical blade secured to the interior of the drum advances tablets from the inlet end to the outlet end of the drum. A first classification slide has its upper end below the outlet end of the drum to receive tablets

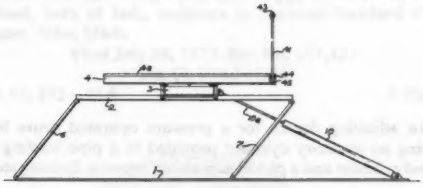
discharged at the outlet end of the drum. The slide has parallel bars spaced apart a predetermined distance to provide for the passage therethrough of tablets having not more than a predetermined maximum thickness. A second classification slide below the first classification slide has parallel bars spaced apart a predetermined distance which is less than the distance between the bars of the first slide in order to retain tablets having more than a predetermined minimum thickness. A chute below the first slide and above the second slide collects tablets passing through the first slide and discharges them adjacent the upper end of the second slide.

3,709,330

LIFTER FOR VEHICLES

Victor S. Wells, P.O. Box 542, and Hal J. Clark, 342 North Glenwood, both of Jackson, Wyo.

Filed Nov. 9, 1970, Ser. No. 87,786
Int. Cl. B66f 7/10
U.S. Cl. 187—8.72 1 Claim



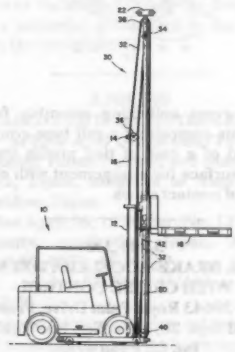
A base supports a lifting frame by means of four parallel arms so the lifting frame may be raised and lowered. A hydraulic jack is connected between the base and the lifting frame to raise the frame. Cross rails on the frame support two lifting pads for movement toward and away from each other. Each pad has wheels rolling on the rails. Guides on the frame and the pads cooperate to keep the pads substantially parallel. Hydraulic jacks on the frame move the pads to and fro. At the end of each pad there is a stop extending above the pad to engage the side of a vehicle and twist the pad horizontally to interlock the guides and stop inward movement of the pad. The hydraulic jacks are combined with a pump and a pressure regulating valve to first cause the pads to move toward each other until stopped, then to lift the lifting frame.

3,709,331

CARRIAGE SAFETY SYSTEM

Raymond L. Smith, Jr., Southbury, Conn., assignor to C & M Manufacturing Company, Inc., Bethesda, Md.

Filed July 24, 1970, Ser. No. 57,931
Int. Cl. B66b 9/20
U.S. Cl. 187—9 2 Claims



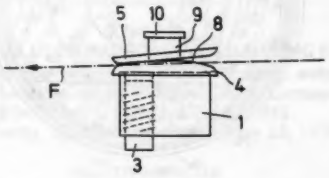
Carriage free fall in catching up with a lowered supporting means is prevented by connecting a chain to a carriage, passing the chain under a fixed lower pulley and then over a fixed upper pulley and connecting the chain to the support. In lift trucks, the support is usually a piston with an idler sprocket over which a chain passes to move the carriage at twice the speed of the piston. The safety chain is passed beneath an idler connected to the piston and is fixed near the upper pulley so that the piston is permitted to move only half the distance of the carriage.

3,709,332

DISC-TYPE BRAKE FOR THREAD

Karl Isac Joel Rosen, Villa Haga, Ulricehamn, Sweden

Filed Jan. 4, 1971, Ser. No. 103,706
Claims priority, application Germany, Jan. 5, 1970, P 20 00 268.0
Int. Cl. F16d 55/00
U.S. Cl. 188—71.1 9 Claims



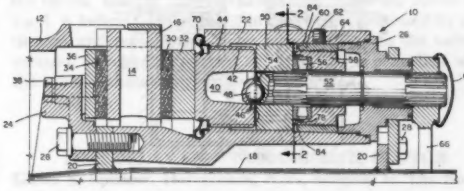
A disc-type brake for thread, with two discs mounted with freedom to rotate, these discs being pressed together by an energy store fitted on a mounting. The energy store acts on the discs eccentrically in relation to their spindle. An inclined bearing surface is provided between the discs so that the planes of rotation of the discs are at an angle to each other.

3,709,333

DISK BRAKE ACTUATOR AND ADJUSTMENT MEANS

Edwin K. Buyze, St. Clair Shores, Mich., assignor to The Budd Company, Philadelphia, Pa.

Filed March 25, 1971, Ser. No. 127,916
Int. Cl. F16d 65/56
U.S. Cl. 188—71.9 4 Claims



A disk brake system having an axially adjustable externally supported disk, a fixed caliper supporting brake pads for engaging the disk, a ball ramp actuating means for moving the brake pads into contact with the disk, and automatic adjustment means for compensating for pad wear and manual adjustment means for initial pad spacing and spacing adjustment after pad replacement.

3,709,334

WHEEL BRAKE ASSEMBLY FITTED WITH AUTOMATIC BRAKE CAP ADJUSTING MEANS

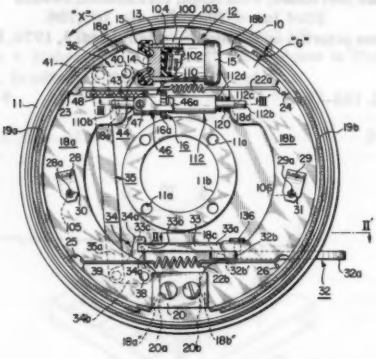
Toshiyuki Kondo, and Asao Kozakai, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Aichi pref., Japan

Filed Dec. 23, 1970, Ser. No. 100,941

Claims priority, application Japan, Dec. 23, 1969, 44/104011; Dec. 23, 1969, 44/104013; Dec. 23, 1969, 44/104014; Dec. 23, 1969, 44/104015

Int. Cl. F16d *51/50*

U.S. Cl. 188—79.5 P 10 Claims



This invention relates to an automotive wheel brake assembly fitted with automatic brake gap adjusting means.

The improvement resides in the provision of a three lever—two link type force transmitting linkage mechanism connecting mechanically a parking brake actuator and an automatic brake adjuster per se which is mounted in proximity to a hydraulic brake actuator.

3,709,335

ENERGY ABSORBER AND METHOD OF OPERATING SAME

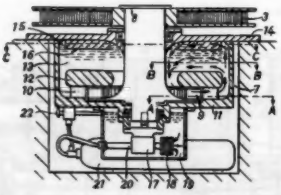
Sixten Einar Carlsson; Lars Halvar Myhr, and Lars-Ake Erling Svensson, all of Norrkoping, Sweden, assignors to Borgs Fabricks Aktiebolag, Norrkoping, Sweden

Filed Jan. 8, 1971, Ser. No. 104,963

Claims priority, application Sweden, Feb. 26, 1970, 2518/70

Int. Cl. B64f *1/02*

U.S. Cl. 188—296 3 Claims



An energy absorber primarily intended for the arresting of aircraft, and a method of operating the same, said absorber having a chamber in which a liquid is pumped around a rotor and stator lattice structure having oppositely curved vanes and blades, with a portion of the liquid in a return chamber given a progressively increased tangential velocity in a potential vortex, and a remaining small portion of the liquid being passed to equal pressure channels to be combined at the rotor inlet, and the remaining portion of the liquid proceeding in a flow direction opposite to the direction of rotation of the rotor so that equal pressure flow compensates for the reduction in pressure of the vortex flow at the rotor inlet.

3,709,336

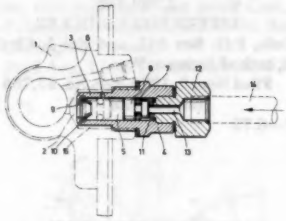
RELEASE DEVICE FOR DRUM BRAKES

Herbert Guthmann, J.-F. Kennedy-Allee 15, 318 Wolfsburg, Germany

Filed Nov. 25, 1970, Ser. No. 92,684

Int. Cl. F16d *65/74*

U.S. Cl. 188—351 4 Claims



An adjusting device for a pressure operated drum brake having an auxiliary cylinder provided in a pipe leading to a wheel cylinder and a piston adjustable between limiting stops.

3,709,337

ELECTRICAL DISTRIBUTION AND CURRENT COLLECTING ASSEMBLY FOR HIGH SPEED DRIVE ARRANGEMENTS

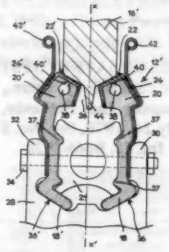
Jean-Pol Payen, Grenoble, France, assignor to Merlin Gerin, Societe Anonyme, Grenoble, France

Filed Oct. 6, 1970, Ser. No. 78,413

Claims priority, application France, Sept. 18, 1970, 7034059

Int. Cl. B60m *1/00, 1/34*

U.S. Cl. 191—22 R 10 Claims



Multi-phase current collecting assembly for high speed drive arrangements comprising a rail type conductor of high rigidity composed of a pair of tied profile strips defining a dihedral contact surface for engagement with mating dihedral contact surfaces of contact shoes.

3,709,338

SINGLE PEDAL BRAKE-ACCELERATOR MECHANISM WITH CRUISE CONTROL

Edward C. Glen, 39643 Royal Palm Drive, Fremont, Calif.

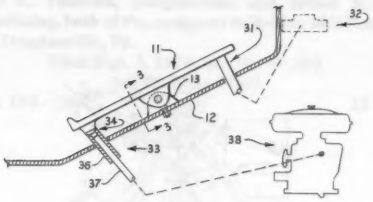
Filed Sept. 28, 1970, Ser. No. 76,174

Int. Cl. F16d *67/00*

U.S. Cl. 192—3 S 4 Claims

A single pedal, throttle and brake actuator for a self-powered vehicle including automatic throttle setting or cruise

control. A single, pivoted foot pedal operates throttle and



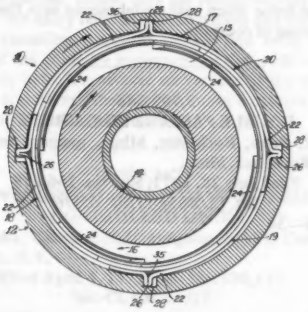
brake mechanisms with holding means maintaining any adjusted throttle position until readjustment by foot pressure.

3,709,339

BAND CLUTCH ASSEMBLY

Max M. Austin, Mishawaka, and Norman B. Boulton, South Bend, both of Ind., assignors to National-Standard Company, Niles, Mich.

Filed July 29, 1971, Ser. No. 167,327
Int. Cl. F16d 41/20
U.S. Cl. 192—41 S 9 Claims



An overrunning clutch comprising drive and driven clutch members, one of which has a V-groove into which the narrow tapered ends of a plurality of interfitting and overlapping clutch bands are disposed. An anchor is provided on the wide ends of the clutch bands which are disposed in slots formed in the other of such clutch members, where the slots are substantially longer than the anchors in a circumferential direction. The slots and anchor are conformably shaped so that as the load is applied the anchor is moving from one end of the slot to the other causes the bands to tighten into a snug pack just as the driving face of the anchor strikes the driving surface of the slot to thereby minimize deflections in the bands as well as radial forces in the drive member.

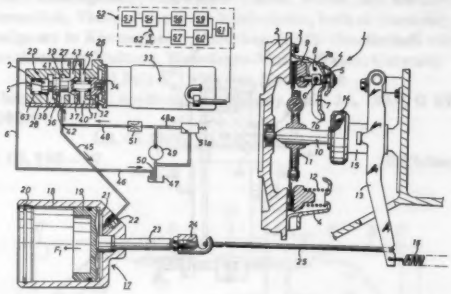
3,709,340

FLUID RELEASED CLUTCH CONTROLLED BY ENGINE SPEED AND GEAR SHIFTER

Noboru Murakami; Tatsuo Naruto, and Nobuyuki Hashimoto, all of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi-ken, Japan

Filed April 26, 1971, Ser. No. 137,256
Claims priority, application Japan, April 27, 1970, 45/36065; April 27, 1970, 45/36067
Int. Cl. F16d 43/284
U.S. Cl. 192—3.58 14 Claims

A spring engaged friction clutch is released by a fluid pressure operated motor controlled by a pressure modulating exhaust valve. At idling speed and during gear shifting, the valve is closed by a solenoid to cause release of the clutch. An electronic device 52 produces and output voltage inversely proportioned to engine R. P. M. so as to supply a decreasing voltage to the solenoid as engine speed increases above idling to



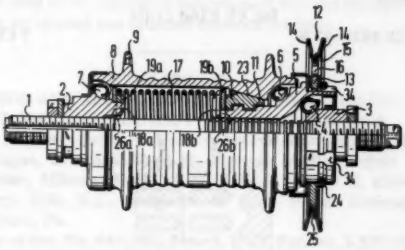
cause the valve to slowly open and the motor to gradually engage the clutch.

3,709,341

ONE WAY CLUTCH DRIVEN BY OSCILLATING DRUM

Horst Schulz, Schweinfurt am Main, Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed May 17, 1971, Ser. No. 143,941
Claims priority, application Germany, May 22, 1970, P 20 25 022.0
Int. Cl. F16d 41/36
U.S. Cl. 192—64 8 Claims



A freewheeling hub for a vehicle wheel has a normally stationary shaft assembly and a driver and hub shell coaxially rotatable on the assembly. A coupling engaged in response to forward rotation of the driver connects the driver to the shell. One end of a flexible cable is wound on a cable drum fixed to the driver, and the cable, when pulled, turns the driver forward. A helical torsion spring in the shell is tensioned by such turning and returns the driver when tension in the cable is relaxed. A vehicle equipped with the hub is propelled when the cable is alternatingly pulled and released.

3,709,342

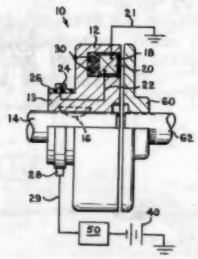
TIME DELAY ELECTROMAGNETIC CLUTCH

Glenn S. Spencer, Horseheads, N.Y., assignor to The Bendix Corporation

Filed Sept. 21, 1971, Ser. No. 182,337
Int. Cl. F16d 27/06
U.S. Cl. 192—52 6 Claims

An electromagnetic clutch or brake including means for automatically retarding or slowing the engagement and release of the armature is shown herein. An additional coil comprising one or more shorted turns of high current capacity wire is included within the magnet body forming an electromagnetic coupling with the main coil to impede the generation and collapse of the main coil-induced electromagnetic field.

Switching means connected in series circuit relationship with the additional coil and located externally of the clutch may also be included so that application of the magnetically retarded coil can be selective.



3,709,343

CLUTCH WITH TEETH ALIGNMENT CAM

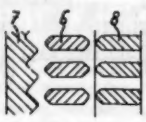
Hans Sigg, Widen, Switzerland, assignor to Maag Gear Wheel & Machine Company Limited, Zurich, Switzerland

Filed Nov. 23, 1971, Ser. No. 201,293

Claims priority, application Germany, Nov. 25, 1970, P 20 58 008.9

Int. Cl. F16d *11/04*

U.S. Cl. 192—67 R **7 Claims**



A gear clutch or coupling has one part with a pair of axially spaced gear rings and another part with a further gear ring engageable alternatively with either of said pair of gear rings. One of the pair of gear rings is relatively narrow and serves simply to align the further gear ring with the other of the pair of gear rings where necessary to allow them to be brought into mesh. For this purpose the teeth of the pair of gear rings are circumferentially offset relative to each other by a distance different from a half tooth pitch.

3,709,344

CLUTCH AND BRAKE PEDAL WITH NEUTRAL SAFETY SWITCH

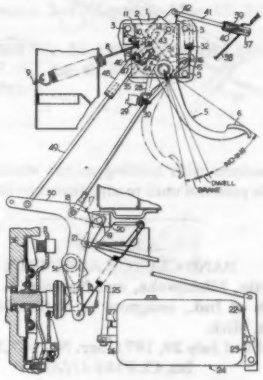
Gerald E. Sieren, Greendale, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 13, 1971, Ser. No. 207,204

Int. Cl. B60k *29/00*

U.S. Cl. 192—.094 **10 Claims**

A vehicle clutch and brake control having a single dependent pedal pivotally supported to sequentially disengage a clutch and engage a brake while simultaneously operating a starter safety switch and having means to a substantially increase pedal force when said pedal moves into the brake engagement phase of rotation.



3,709,345

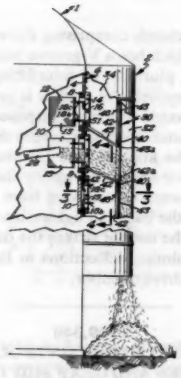
DOUBLE PASSAGE SILO CHUTE

Raymond R. Price, Rochester, Minn., assignor to Rochester Silo Co., Rochester, Minn.

Filed July 28, 1971, Ser. No. 166,679

Int. Cl. B65g *11/02, 65/36*

U.S. Cl. 193—34 **11 Claims**

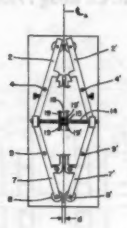


A silo chute having a vertical dividing wall extending over substantially its entire length and separating the interior of the chute into a service and access passage through which access may be obtained to the interior of the silo through vertically spaced door openings therein and an ensilage passage through which ensilage is discharged from the silo. A plurality of vertically spaced discharge openings in one wall of the ensilage discharge passage are normally closed by doors which may be selectively opened to place the discharge passage in flow communication with the interior of the silo at a level corresponding to the level of ensilage therein.

3,709,346
ROLLER GUIDE

Edward C. Peterson, Douglassville, and Ernest E. Davis, Wyomissing, both of Pa., assignors to Rolling Mill Engineers, Inc., Douglassville, Pa.

Filed Sept. 3, 1970, Ser. No. 69,258
Int. Cl. B65g 13/00
U.S. Cl. 193—35 C 23 Claims

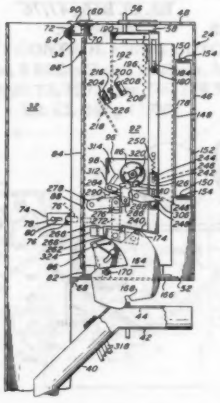


A guide for feeding stock to the rolls of a rolling mill in proper orientation is disclosed. A pair of guide roller carriers and a pair of entry bells with rollers are pivotally mounted to a base and are joined for interrelated movement by a common adjusting mechanism. Guide bars are semifloatingly mounted intermediate the entry bells and guide rollers and are urged by appropriate camming structure toward and away from the center line of the guide by movement of the guide roller carriers and entry bells. Transverse movement of the center line of the guide is accomplished by mounting a captive threaded member to the adjusting mechanism.

3,709,347
BAG VENDING MACHINE HAVING FEELER CONTROLLED LOCK

Henry Verbeke, Chester, N.J., assignor to APL Corporation, Great Neck, N.Y.

Filed April 1, 1971, Ser. No. 130,117
Int. Cl. G07f 5/16
U.S. Cl. 194—94 17 Claims

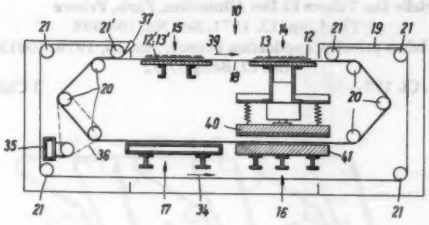


A vending machine adapted to dispense bags having bail handles. The bags are stored by placing the bails over a vertically extending shaft, and by providing a metering device at the top of the shaft whereby only one bag can be dispensed at a time. The metering device is coin controlled, and a mechanism is provided for varying the price at which the bags will be vended. A totalizer is provided whereby coins of varying denominations can be deposited until the predetermined price set for each bag has been reached.

3,709,348
GLUEING PRESS FOR GLUEING FLAT SHAPED TEXTILE ARTICLES

Herbert Kannegiesser, Hollwiesen-Vlotho, Weser, and Richard Juraschek, Vlotho, Weser am Kinderheim, both of Germany, assignors to Kannegiesser Maschinenfabrik Gesellschaft mit beschrankter Haftung, Hollwiesen-Vlotho/Weser, Germany

Filed July 6, 1970, Ser. No. 52,400
Claims priority, application Germany, July 24, 1969, G 69 29 202.0
Int. Cl. B65g 15/14; B23g 5/22
U.S. Cl. 198—19 10 Claims



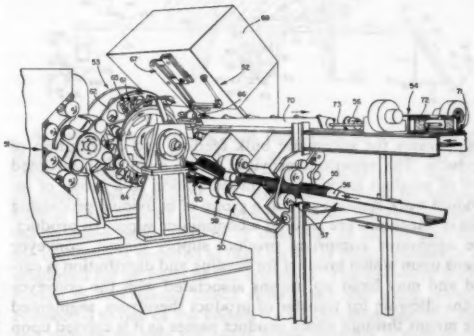
A glueing press, with operating and treatment stations arranged one above the other, includes a transportation system for transporting textile articles, which are to be glued together, from the operating stations to the treatment stations and back to the operating stations in such a manner as to provide shift free transportation of the textile articles.

The transportation system includes a pair of circulating conveyor belts, which coincide, one directly over the other, outside the area of the operating stations such that the textile articles can be located and retained between the belts.

3,709,349
METHOD AND APPARATUS FOR REMOVING OBJECTS FROM CONTINUOUSLY MOVING MANDRELS

Eric S. Buhayar; James E. Hazard, both of Swarthmore; John J. Jaagus, Broomall; Fred W. Werner, Media; Robert W. Wheeler, Milmont Park, all of Pa., and Robert C. Crowe, Cherry Hill, N.J., assignors to Scott Paper Company, Delaware, Pa.

Division of Ser. No. 644,955, June 9, 1967, Pat. No. 3,507,682.
This application March 4, 1970, Ser. No. 19,135
Int. Cl. B65g 47/00
U.S. Cl. 198—25 11 Claims



A method and apparatus for removing hollow containers such as cups having a generally circular cross-section and a cylindrical or frusto-conical shape from an orbiting mandrel continuously moving the containers through a process where their side walls are printed. The removal apparatus of the in-

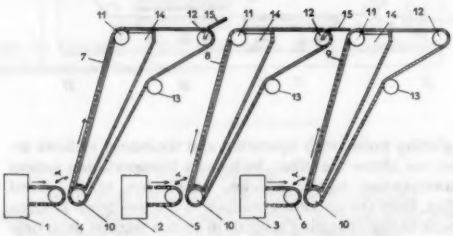
vention utilizes a suction cup movable through an orbital path and adapted to engage the closed end of the container and to move it rapidly to a conveyor means for transfer to a remote position without contacting the printed side wall of the container.

3,709,350

METHOD AND DEVICE FOR CONSTITUTING A CONTINUOUS STREAM OF A PLURALITY OF SUPERPOSED LAYERS OF ROD-SHAPED OBJECTS SUCH AS CIGARETTES

Jacques Flesselles, and Raymond Poupin, both of Fleury-les-Aubrais, France, assignors to Service D Exploitation Industrielle Des Tabacs Et Des Allumettes, Paris, France

Filed Jan. 13, 1971, Ser. No. 106,098
Claims priority, application France, Jan. 16, 1970, 7001540
Int. Cl. B65g *57/32*
U.S. Cl. 198—35 **2 Claims**



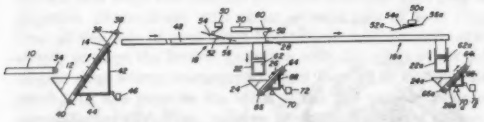
Method of constituting a continuous stream of a plurality of superposed layers of rod-shaped objects, such as cigarettes comprising the steps of introducing successively objects in at least one point of a first continuous stream of said objects and introducing further objects from below under the lower layer of said first stream and device for carrying out the method.

3,709,351

AUTOMATIC BULK FEEDING AND DISTRIBUTING APPARATUS

C. G. Peter Oldershaw, Avon, and Don De Kramer, Lima, both of N.Y., assignors to General Foods Corporation, White Plaines, N.Y.

Filed Feb. 4, 1971, Ser. No. 112,532
Int. Cl. B65g *43/08*
U.S. Cl. 198—37 **8 Claims**



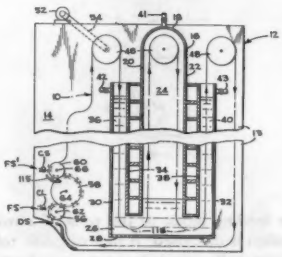
Apparatus for automatic bulk feeding and distribution of products. The apparatus provides for an even, uninterrupted flow of product from a bulk infeed station to a group of individual work stations so that a group of individual processing lines or machines are assured a continuous supply of product. The apparatus comprises product supply means, conveyor means upon which product for feeding and distribution is carried and may build up, means associated with the conveyor means allowing for transfer of product therefrom, segmented gate means through which product passes as it is carried upon and along the conveyor means, means for detecting the level of product as it is carried along the conveyor means, control means which are connected to the gate means and detecting means and the product supply means and product receiving and discharging means which are associated with the conveyor means and control means. The apparatus is especially useful in the processing of agricultural commodities.

3,709,352

MULTIPLE PITCH PROCESSING CONVEYOR

James L. Reimers, and Adil A. Mughannam, both of San Jose, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Dec. 17, 1970, Ser. No. 99,183
Int. Cl. B65g *17/00*
U.S. Cl. 198—131 **13 Claims**



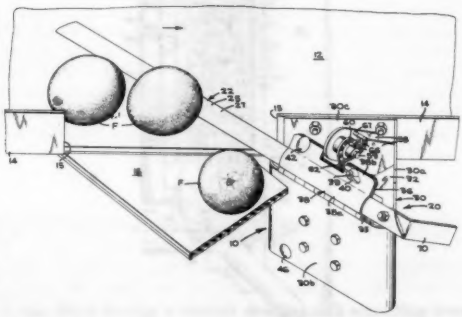
A multiple pitch conveyor for supporting elongated articulating carrier bars which are spaced different distances apart. Each carrier bar cooperates with the next adjacent carrier bar so as to confine a row of containers of one size range on one side thereof and to confine a row of containers of another size range on the other side thereof when passing through the heat treatment chamber of a cooker. The carrier bars are specifically designed to maintain positive container control and maximum container density per running foot of conveyor while permitting the cooker to handle at least two different size ranges of containers with the same or different commodities hermetically sealed therein.

3,709,353

CONVEYOR DIVERTER MECHANISM

Charles E. Sheetz, Woodstock, Va., assignor to FMC Corporation, San Jose, Calif.

Filed July 21, 1971, Ser. No. 164,728
Int. Cl. B65g *47/76*
U.S. Cl. 198—28 **14 Claims**

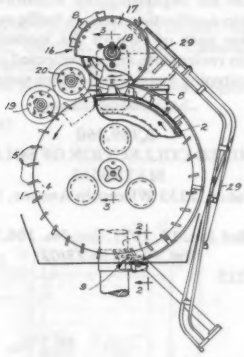


A smooth surfaced diverting blade extends transversely across an endless belt conveyor arranged to carry fruit. The blade is pivotally mounted at one edge thereof with the other edge being connected to a solenoid actuated lift assembly whereby the blade can be selectively maintained in either a first position wherein it lies flat upon the conveyor permitting the fruit to pass thereover or a second position wherein it is pivoted upwardly to block the path of the fruit on the conveyor thereby causing the fruit to be diverted therefrom.

3,709,354
POSITIONING DEVICE FOR CONICAL SUBJECTS

Jakobus Petiet, Leiden, Netherlands, assignor to N. V. Leidsche Apparatenfabriek, Leiden, Netherlands

Filed Sept. 17, 1970, Ser. No. 73,164
Claims priority, application Netherlands, Sept. 17, 1969, 6914108
Int. Cl. B65g 47/24; B65h 9/00
U.S. Cl. 198—33 AA 6 Claims

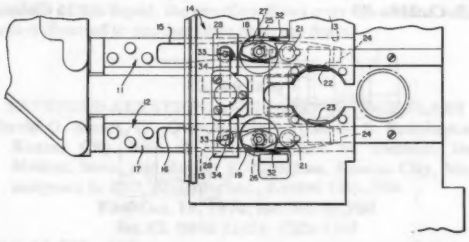


Apparatus for transferring substantially conical subjects of an elastic material, such as truncated caps for bottles of a plastic material from a supply container into a store holder in a predetermined position comprising a horizontal shaft mounted to said apparatus, a plurality of parallel rotatable discs mounted on said shaft and positioned at a distance from each other greater than the larger diameter of the conical subjects. The inner walls of the discs are provided with means to temporarily hold the conical subjects near their larger diameter. The rotatable discs are able to rotate simultaneously with such a velocity that the conical subjects held thereby are positioned by centrifugal forces with their smaller diameter directed outward. Means are also provided for continuously removing the positioned conical subjects and for moving the conical subjects to the store holder.

3,709,355
STACK HEIGHT CONTROL USING CUTOFF KNIVES

William B. Harrison, 8 Ridley Road, Dedham, Mass.

Filed Sept. 13, 1971, Ser. No. 179,924
Int. Cl. B65g 47/06
U.S. Cl. 198—59 4 Claims

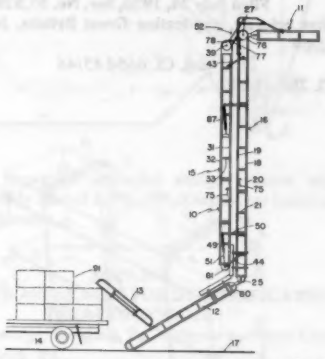


In the usual machine which applies sealing compound to a container closure, a special attachment prevents the feeding of the last few container covers remaining in a feed stack, and permits the feed of closures as soon as the stack of closures to be fed is rebuilt to its proper height. The present machine eliminates this entire mechanism, and supports the few remaining closures in the feed stack on the cutoff knives which themselves become disabled when the closures in the feed stack reach the selected low number. Stack bounce and disarranged closures are eliminated by this device.

3,709,356
VERTICAL BALE ELEVATOR

Harry Donald Crawley, Winnipeg, Canada, assignor to Allied Farm Equipment (Manitoba) Ltd., Winnipeg, Manitoba, Canada

Filed March 1, 1971, Ser. No. 122,571
Int. Cl. B65g 15/14
U.S. Cl. 198—162 8 Claims

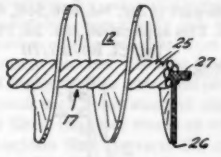


An inner vertical elevator is secured between the feed-in section and the upper horizontal mow conveyor. An outer elevator is supported by parallel linkage in front of the inner elevator with the bales engaged by the conveyor chains of the two elevators. Tension springs govern the engagement of the conveyors with the bale and a conveyor thrower takes the bales from the vertical elevator and transfers them to the mow conveyor.

3,709,357
FLEXIBLE HELICAL CONVEYOR FOR LIQUIDS

Kenard D. Brown, 1227 South Willow Street, Casper, Wyo.

Continuation-in-part of Ser. No. 808,054, March 18, 1969, abandoned. This application May 8, 1970, Ser. No. 35,628
Int. Cl. B65g 33/00
U.S. Cl. 198—213 7 Claims



A system for removing light fluid such as oil from heavy fluids such as water comprises an extended length of open screw conveyor constructed of material such that it will float on water. The conveyor may comprise a helical fin having a central bead or core about which stranded cables are wound, the stranded cables may be of steel wire or plastic and when the conveyor is required to float on water plastic materials are employed for all parts of the conveyor. The conveyor is connected to two spaced motor vessels one end being pivotally connected to one of the vessels for free rotation and the other end passing up into the other vessel through a surrounding conduit and being rotated by a motor mounted on the other vessel. A reservoir is provided in the other vessel to collect the liquid. During operation the cable is rotated in a direction to draw the liquid toward the reservoir vessel and the two vessels are moved forward to sweep an area covered with oil or other

lighter fluid. In another embodiment the flexible helical drive member is housed in a flexible tubing having a longitudinal opening for admitting the lighter liquid from the surface of the body of heavy liquid, the entire assembly thus formed floats on the body of liquid.

3,709,358

PACKAGES OF GLASS IN SHEET FORM

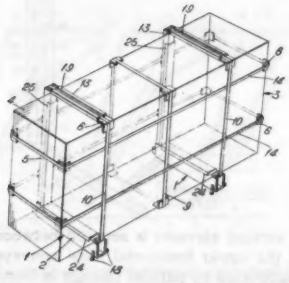
Brian Andrews, Orrell, near Wigan; James Christopher Pilkington, Rainhill, near Liverpool, and Brian William Riley, Tarleton, near Preston, all of England, assignors to Pilkington Brothers Limited, Liverpool, England

Filed July 24, 1970, Ser. No. 57,929

Claims priority, application Great Britain, July 28, 1969, 37,861/69

Int. Cl. B65d *85/48*

U.S. Cl. 206—62 R **16 Claims**



A package of glass sheets comprises a stack of glass sheets arranged vertically. An L-shaped bracket is disposed partially around the stack with one of its arms underlying the bottom edge of each sheet of the stack and with its other arm extending up one of the vertical faces of the stack, and the stack is strapped to the bracket.

ERRATA

For Classes 206—65 Y thru 209—75 see:
Patents Nos. 3,709,325 thru 3,709,329

3,709,359

ORE CLASSIFIER

Carl L. Johnson, 1404 Hudson Street, Denver, Colo.

Continuation-in-part of Ser. No. 630,560, April 13, 1967, Pat. No. 3,511,446. This application Jan. 26, 1970, Ser. No. 5,544

Int. Cl. B07b *7/10*

U.S. Cl. 209—138 **11 Claims**

An ore classifier in which a mass of reduced ore having a commingled gangue and mineral particles in it is circulated under blower pressure in a vertical plane in a somewhat circular chamber wherein the inlet for the commingled mass and the outlet for the gangue are tangential to the chamber and cross each other at the bottom through a plenum to scrub the gangue of any concentrate electrostatically held thereon. A classifier stack is disposed vertically at the top of the chamber for levitation of fines in relation to their size and weight for classification purposes and the classification means may be a plurality of spaced openings or an extendable member selectively adjustable for regulating the withdrawal of classified concentrates into a collection tank. A baffle system defining in part the primary path of flow of the incoming commingled mass operates to recirculate any uncollected concentrates still mixed in with outgoing gangue and return same to the stack.

3,709,360

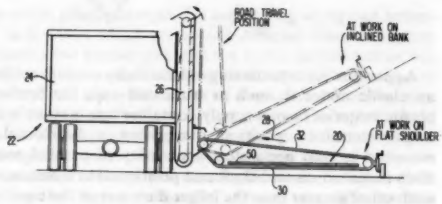
MECHANIZED COLLECTION OF SOLID WASTE MATERIAL

Raymond N. Baker, 2233 Wisconsin Avenue, N. W., Washington, D.C.

Filed Jan. 15, 1971, Ser. No. 106,733

Int. Cl. C10g *23/02*

U.S. Cl. 209—215 **12 Claims**



Provision is made for mechanized collection of solid waste materials along highways and the like by use of endless-belt type magnetic conveyors, operable in conjunction with trucks, tractors, grass cutters and other roadside maintenance vehicles. Enchanced retrieval results from articulation of the conveyor arm and use of cyclically operative electromagnets. Methods are provided for making glass, paper laminates, and the like magnetizable by inclusion of magnetic material during manufacture or fabrication.

3,709,361

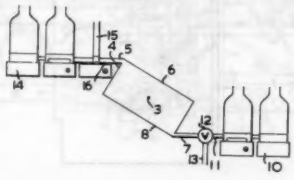
DEVICE FOR SEPARATING LIVING CELLS

Richard G. Miller, Toronto, Ontario, Canada, assignor to Ontario Cancer Institute, Toronto, Canada

Filed May 26, 1970, Ser. No. 40,542

Int. Cl. B01d *21/02*

U.S. Cl. 210—83 **16 Claims**



The present invention relates to an apparatus for use in the separation of living cells by velocity sedimentation under unit gravity which apparatus comprises a frame, a closed vessel mounted in said frame about a horizontal axis for rotation between a sedimentation position and a loading and unloading position, said vessel having opening means adjacent the bottom wall thereof and opening means adjacent the top wall thereof for the introduction and removal of liquids to and

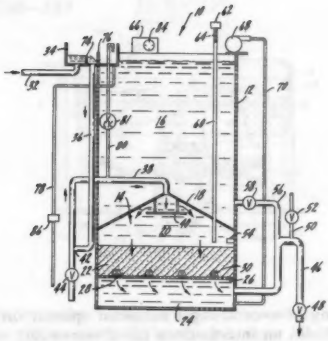
from said vessel, said vessel being shaped and dimensioned such that contours of equal density in a liquid medium substantially filling said vessel extend between the side walls of said vessel when said vessel is in the sedimentation position and between the side walls and the top wall of said vessel when said vessel is in the loading and unloading position. The present invention also relates to a method of separating living cells in a sample using said apparatus.

3,709,362

SELF-BACKWASHING FILTER APPARATUS

Anders Lindstol, Oakville, Ontario, Canada, assignor to Ecodyne Corporation, Chicago, Ill.

Filed May 12, 1970, Ser. No. 36,553
Int. Cl. B01d *23/26*
U.S. Cl. 210—108 **8 Claims**



An improved self-backwashing filter of the type having a lower filter chamber and an upper backwash storage chamber. In one embodiment, the service outlet pipe means comprise an inverted U-shaped siphon pipe, the top of which is at least as high as the upper level of the filter means. Air vent means communicate with the siphon, and liquid level sensing means are positioned in the filter chamber above the filter means. The liquid level sensing means are operatively connected to the air vent means to open the air vent means, breaking the siphon when the liquid level falls past the liquid level sensing means. In another embodiment, a head box is provided, and the liquid inlet means comprise an inlet pipe, a head box, and a downtake pipe. Liquid from the inlet pipe flows over the first weir to the downtake pipe. If the downtake pipe does not accept all of this liquid, the overflow flows over the second weir, and is diverted to another filter or to the drain.

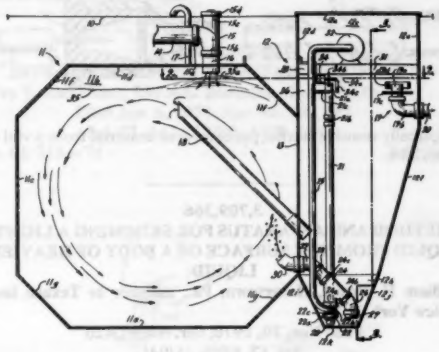
3,709,363

EXTENDED AERATION, ACTIVATED SLUDGE PLANT

David O. Smart, IV, Overland Park; Grover B. Pennington, Kansas City, both of Kans.; Richard M. Plettner, Des Moines, Iowa, and Robert F. Maughan, Kansas City, Mo., assignors to BiO_2 Systems, Inc., Kansas City, Mo.

Filed Oct. 19, 1970, Ser. No. 81,780
Int. Cl. B01d *21/24;* **C02c** *1/08*
U.S. Cl. 210—195 **5 Claims**

Sewage plant apparatus and an improved, activated sludge process. The sewage plant generally comprises an aerator into which sewage is fed and is vigorously circulated and aerated by compressed air and, a clarifier from which treated liquid is discharged through an effluent line fitted with a collar and scum baffle. Tubular conduits permit mixture flow from the aerator to the clarifier. Both a skimmer and a sludge return, through which flow is induced by compressed air, recycle mixture from the clarifier back to the aerator. The skimmer is equipped with cleaning, defoaming and flow circulation



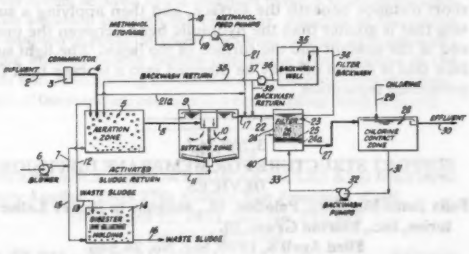
devices. The improved activated sludge process includes recycling at a daily rate of 2,000 to 5,000 percent based on the volume of the aerator.

3,709,364

METHOD AND APPARATUS FOR DENITRIFICATION OF TREATED SEWAGE

Elton Stuart Savage, Wexford, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Sept. 2, 1970, Ser. No. 68,917
Int. Cl. C02c *1/06*
U.S. Cl. 210—195 **8 Claims**



Method and apparatus for denitrification of aqueous nitrate-containing solutions. Specifically the invention provides for denitrification of the effluent from an activated sludge sewage treatment process. Effluent from the settling zone of an activated sludge sewage treatment process containing nitrogen compounds such as nitrates and nitrites, is passed through a deep bed filter, the filter media of which has been innoculated with bacteria that converts the nitrogen compounds to nitrogen gas. The filter, in addition to removing the nitrogen compounds, removes any suspended solids from the settling zone effluent, so that the final effluent from the filter is concurrently clarified and denitrified. By controlling the backwash of the filter, bacteria is retained thereon so as to enable continuous use of the filter for denitrification.

3,709,365

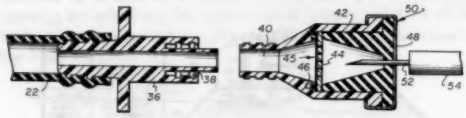
DISPOSABLE PHARMACEUTICAL STERILE CLOSURES

Thomas V. Czaplinski, North Brunswick, and Thomas A. Haney, East Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed June 1, 1970, Ser. No. 42,354
Int. Cl. B01d *35/00*
U.S. Cl. 210—233 **4 Claims**

Disclosed herein is a disposable sealed sterile closure for use primarily in radiopharmaceutical preparations. The stopper is

of the type that can be pierced by a hypodermic needle to



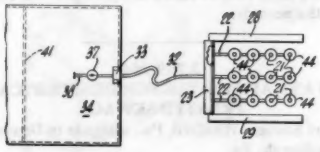
aseptically remove sterile, pyrogen-free material from a vial or generator.

3,709,366

METHOD AND APPARATUS FOR SKIMMING A LIGHT LIQUID FROM THE SURFACE OF A BODY OF HEAVIER LIQUID

William H. Pruitt, Havertown, Pa., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 20, 1970, Ser. No. 91,420
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **1 Claim**



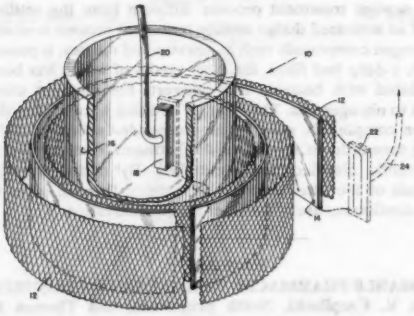
A method or apparatus which acts to create plural vortices at the surface of a body of liquid floating on top. The vortices are created by locating plural conduits with the open ends a short distance beneath the surface, and then applying a suction that is greater than the hydraulic head between the open end of the conduit and the surface of the liquid. The light surface that is drawn off may be pumped into a storage tank for permitting separation.

3,709,367

SUPPORT STRUCTURE FOR MEMBRANE DIFFUSION DEVICES

Felix Jesus Martinez, Palatine, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed April 8, 1970, Ser. No. 26,546
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 **19 Claims**



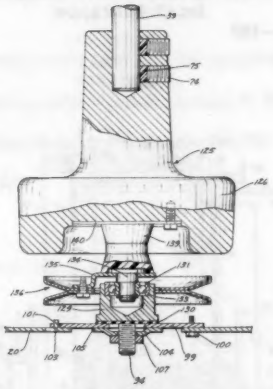
A support structure in the form of a foraminous screen netting having an upper plurality of strands arranged in parallel fashion and intersecting at an angle with a lower plurality of strands, also arranged in parallel fashion. Each strand provides a ridge whose apex extends in a direction generally normal to the plane of the screen upon which is supported substantially by line contact a semipermeable dialyzing membrane. Between each ridge is a groove into which extend channels defined in the membrane by the ridges.

3,709,368

CENTRIFUGAL EXTRACTOR MOUNTING

Edward O. McCartney, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Continuation-in-part of Ser. No. 886,184, Dec. 18, 1969, abandoned. This application Feb. 25, 1971, Ser. No. 118,766
Int. Cl. B07b *1/42*
U.S. Cl. 210—365 **20 Claims**



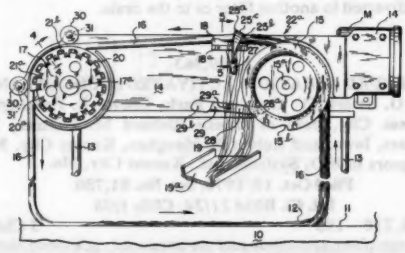
A mounting of a centrifugal extractor spinner on a base member includes an intermediate panel removably attached to the base member with the spinner adjustably mounted on the intermediate panel for centering the spinner on a substantially vertical axis. The spinner and panel may be removed from the base member without disturbing the centering of the spinner to the intermediate panel. A resilient member is interposed between the spinner and the base member to permit nutational movement of the spinner.

3,709,369

POWER DRIVEN TRANSFER ROLL FOR FLEXIBLE OIL COLLECTOR TUBE

Eugene L. Brill, and Beatrice M. Brill, both of 1803 West Royalton Road, Cleveland, Ohio

Filed May 7, 1971, Ser. No. 141,227
Int. Cl. E02b *15/04*
U.S. Cl. 210—400 **16 Claims**



A flexible, hose-like elongated collector adapted for collecting hydrophobic materials floating in a layer on the liquid in a reservoir of water or the like is formed into an endless loop which passes into or upon the liquid in the reservoir, then upwardly and out through or away from the layer of hydrophobic

material which collects on the surface of the collector, after which a doctor blade means scrapes the coated material therefrom. The present improvement provides a transfer roll over which the collector passes during its travel away from the reservoir and toward the drive wheel which pulls it over the transfer roll or wheel and drives the collector again downwardly toward the reservoir. This transfer roll furnishes a large radius fair lead for the tube so that sharp bends in the tube are avoided. It also prevents twisting and tangling of the up-coming loaded tube with the downwardly traveling scraped or clean tube. The apparatus also confines the collector tube so that various scrapers can be utilized to give a cleaner tube and to give a longer scraper life.

3,709,370

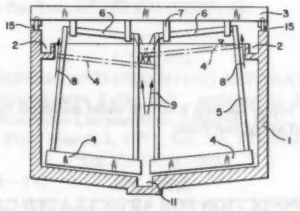
SCRAPER ASSEMBLY FOR WASTE TREATMENT TANKS

Leonhard Fechter, Michelbach, Germany, assignor to Passavant-Werke, Michelbacher Hutte, Germany

Filed Aug. 20, 1971, Ser. No. 173,467

Int. Cl. B01d *21/18*

U.S. Cl. 210—527 **10 Claims**



In waste treatment tanks having overflow weirs on the sides thereof, a scraper assembly in which scraper blades are each pivoted to a lowered position on the tank floor with the blade ends extending beneath the weirs, and a raised position in which the blades are positioned above the weirs, without additional movement of the scraper blades along the pivot axes. The pivot axes are angled rearwardly and/or downwardly from the tank edge to achieve this operation.

3,709,371

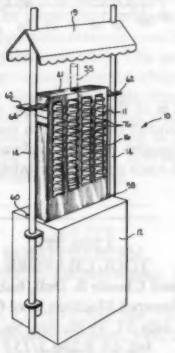
DISPLAY CONTAINER

Raymond T. Luck, Chicago, Ill., assignor to Kraftco Corporation, New York, N.Y.

Filed March 19, 1971, Ser. No. 126,153

Int. Cl. A47f *7/28, 1/00*

U.S. Cl. 211—49 D **5 Claims**



In a display stand for containing and exhibiting flexible bags filled with flowable material so that the bags can be shaped. Front and rear vertical panels have openings formed therein, each opening having vertically extending and wavy side edges, the bags extending through the openings and resting upon lands of the wavy side edges.

3,709,372

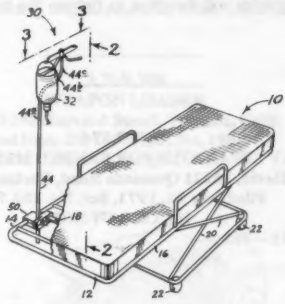
INTRAVENOUS SUPPLY CONTAINER SUPPORT

Larry T. Alexander, 750 N.E. Burnside, Gresham, Oreg.

Filed Jan. 6, 1971, Ser. No. 104,402

Int. Cl. A61g *12/00*; A47b *73/00*

U.S. Cl. 211—74 **8 Claims**



Apparatus for supporting intravenous supply bottles including an upright standard and a cross bar extending substantially horizontally across the top of the standard. An elongated cantilever spring secured to the standard extends to opposite sides of the standard beneath the cross bar. Reaches of the spring are adapted to press into tight frictional contact with upwardly facing ends of supply bottles depending from catches in the cross bar. A mounting for the standard permits vertical adjustment of the standard relative to a bed or other body support.

3,709,373

SUSPENDABLE SUPPORT FOR ARTICLES AND METHOD

Henry Aguilar, 1309 27th Avenue, San Francisco, Calif.

Filed April 12, 1971, Ser. No. 133,312

Int. Cl. A47f *5/08*

U.S. Cl. 211—113 **5 Claims**

An elongated main supporting element having a plurality of elongated, flexible loops secured at one of their ends to said element at spaced points along said element. The opposite

ends of said loops are closed and each has a finger graspable tab or extension projecting from the closed end. The elongated loops are flexible and each comprises a pair of strands of strong, flexible material in side-by-side relation for forming a conventional lark's head hitch to provide a bight or slip noose within which an article may be gripped and releasably held for suspension from the elongated main element. The bight adapted to be formed by the lark's head hitch will securely hold the article within the bight, and the extension or tab on the closed end of the loop enables a quick release of the bight for removing the article. A loop at one or both ends of the main supporting element enables suspending it and the loops will be suspended substantially vertically from the main element before and after an article is held in the hitch that may be formed in the respective loops, and the influence of gravity on such articles will function to tighten the bight about each article.

3,709,374

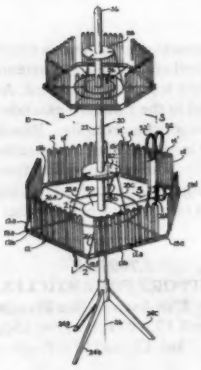
DISPLAY APPARATUS FOR BANDED MERCHANDISE

Melvin J. David, 16221 Quemada Road, Encino, Calif.

Filed July 21, 1971, Ser. No. 164,735

Int. Cl. A47f *5/02*

U.S. Cl. 211—163 **1 Claim**



An apparatus for displaying banded merchandise, such as fan belts, providing good customer visibility, ease of removal and replacement, lack of damage to the merchandise and efficient utilization of available display space. The present invention is comprised of (i) one or more horizontally disposed main members, each having disposed along its periphery a plurality of paired vertical members adapted for holding the bands of banded merchandjse, and (ii) a support structure adapted to support the main members in their horizontal attitudes. In use, the band of an article of banded merchandise which is td be display is slipped over one of the vertical members. The band holds the article of merchandise while the vertical member and the main member of which it is a part support the band, thereby holding the merchandise in place for display and removal. One preferred embodiment of this invention comprises (i) a pair of concentric circumferential main members, vertically displaced from one another, each having disposed around its periphery a plurality of vertically paired members, and (ii) a floor-standing vertical support structure disposed through the centers of the spaces enclosed by the main members and to which the main members are rotatably coupled.

3,709,375

CRANES

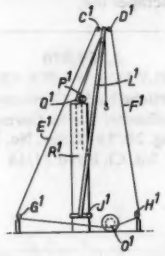
Robert Morrison, Greenock, and James Taylor MacNeill, Kilbirnie, both of Scotland, assignors to Speedcranes Limited, Gourock, Renfrewshire, Scotland

Filed Jan. 12, 1970, Ser. No. 1,998

Claims priority, application Great Britain, Jan. 10, 1969, 1,628/69

Int. Cl. B66c *23/06*

U.S. Cl. 212—58 **3 Claims**



A derrick crane having a single mast adapted for operation both fore and aft of the mast.

3,709,376

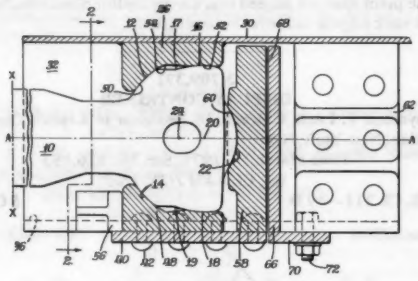
CONNECTION FOR ARTICULATED CAR

Russell G. Altherr, Munster, Ind., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Sept. 21, 1970, Ser. No. 73,928

Int. Cl. B61g *5/00*

U.S. Cl. 213—62 R **5 Claims**



The connection is of the rotary type and is nonresilient. A draw bar has a rounded head at each end received in respective sockets in adjacent ends of railway cars. A removable shim is provided in each socket to minimize excessive longitudinal slack.

3,709,377

TOOL CHANGER

Walter V. Sturm, and Claude S. Doll, both of Sidney, Ohio, assignors to The Monarch Machine Tool Company

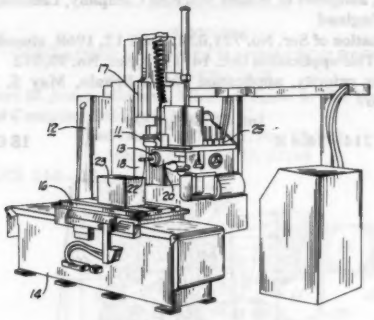
Filed July 31, 1970, Ser. No. 60,021

Int. Cl. B23q *3/155*

U.S. Cl. 214—1 BD **20 Claims**

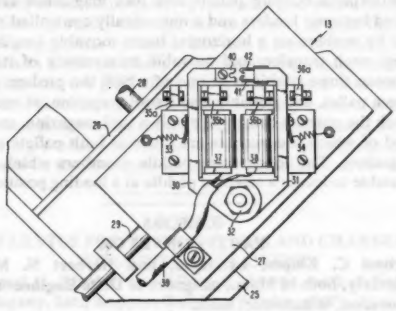
A tool changer as shown which moves in first, second and third different paths in moving a tool adapter from an operat-

ing spindle to a position adjacent a tool storage magazine. The tool adapter grip is moved by grip means in the third path, is moved by power means in the second path and is moved by



motive means in the first path. The power means is also controlled so as to move the tool adapter grip in a fourth path different from the first, second and third paths.

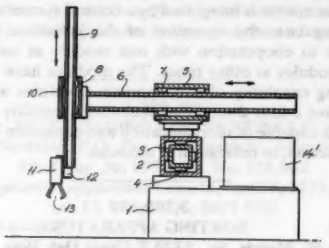
3,709,378
ALIGNING AND ORIENTING APPARATUS
Zvi Segal, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed March 4, 1971, Ser. No. 121,096
Int. Cl. B65g 7/00
U.S. Cl. 214—1 Q **5 Claims**



Aligning and orienting apparatus for semiconductor chip handling apparatus. The aligner and orienter are positioned at one of the handling apparatus stations coacting with an indexable vacuum pencil spider assembly. The pencils under pneumatic control pick up semiconductor chips from bowls and transport them to the aligning and orienting station and then for subsequent handling such as testing and sorting based on the test results. Aligning and orienting is performed by activatable arms carrying aligners at corresponding coacting ends acting on the surfaces of the chip.

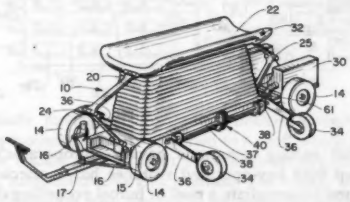
3,709,379
ROBOT SYSTEM
Roland T. A. Kaufeldt, Stambanewagen 81-83, Huddinge, Sweden
Filed Feb. 17, 1971, Ser. No. 116,124
Claims priority, application Sweden, Feb. 22, 1970, 2225/70
Int. Cl. B25j 9/00
U.S. Cl. 214—1 BB **8 Claims**

A system for accurately damping and thereafter stopping high-speed displacement of robot arms in individual directions with substantially no play simultaneously with transmission of



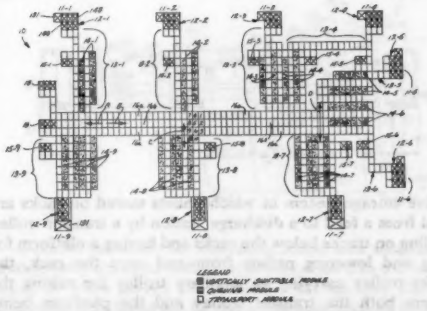
a signal for initiating displacement of other robot arms during the damping.

3,709,380
WEAPON LOADER
Clyde C. Cole, 5298 Harvard Street, Ventura, Calif.
Filed Sept. 30, 1971, Ser. No. 188,702
Int. Cl. B65g 7/00
U.S. Cl. 214—1 D **7 Claims**



A flexible, rapid-lift rate, rapidly positioned missile loader with sufficient pitch-roll-yaw freedoms to accelerate weapon loading and the like. The missile loader poses the missile on a long spring column of air leaving it free to be "float" positioned to final indexing. Air is induced into bellows type lifting elements by a low pressure powered blower. Transverse positioning of the loader carriage is easily accomplished through the provision of air-actuated lift outrigger wheels.

3,709,381
CARGO HANDLING SYSTEM AND METHOD
Norman M. Sullivan, and Francis J. Fitzgerald, Jr., both of Grand Rapids, Mich., assignors to Rapistan Incorporated, Grand Rapids, Mich.
Division of Ser. No. 703,514, Jan. 23, 1968, Pat. No. 3,592,333. This application July 1, 1970, Ser. No. 60,208
Int. Cl. B65g 43/00
U.S. Cl. 214—11 R **7 Claims**



An article transporting system made up of a large number of individual modules, each of which is a complete and independent conveyor within itself. Each module provides a low-friction article supporting bed and powered means for forcibly

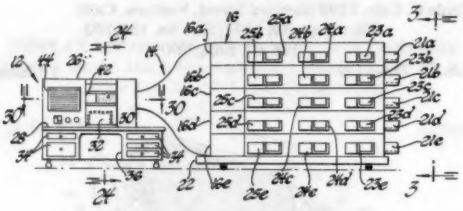
moving the articles over this bed. Articles are moved from module to module in "start-stop" fashion. The functioning of the entire system is integrated by a control system which selectively regulates the operation of the individual modules to function in cooperation with one module at one time and other modules at other times. The modules have a minimum operating capability of two opposite directions and in many cases have a four directional operating capability. The entire system is capable of reorganization and expansion by the addition, deletion, or relocation of modules.

3,709,382

SORTING APPARATUS

William W. Morris, Sr., 5320 F Great Oak Way, Columbus, Ohio

Filed June 4, 1971, Ser. No. 149,900
Int. Cl. B65g *43/00*
U.S. Cl. 214—11 R **23 Claims**



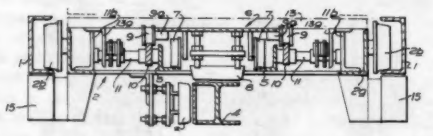
A mail sorting apparatus having an operator's console equipped with key-operated switches has a selector section positioned intermediate a mail or parcel propelling device and a diverter section which includes sorted mail receiving trays. Operation of any of the key switches selects a particular related channel or chute in the selector section and a particular related diverter door to be opened in the diverter section so as to present one path which that iemt of mail or parcel post must follow to the desired receiving tray. Operation of an other of the key switches causes the establishment of another particular related path for the article to follow to another receiving tray.

3,709,383

RACKS FOR STORAGE AND TRANSFER PURPOSES

Kingsley Jeffrey Jennings, and Frederick Gifford Ward, both of Loughborough, England, assignors to Herbert Morris Limited, Loughborough, Leicester County, England

Filed March 17, 1971, Ser. No. 125,262
Claims priority, application Great Britain, March 23, 1970, 14,020/70
Int. Cl. E04h *6/06*
U.S. Cl. 214—16 B **6 Claims**



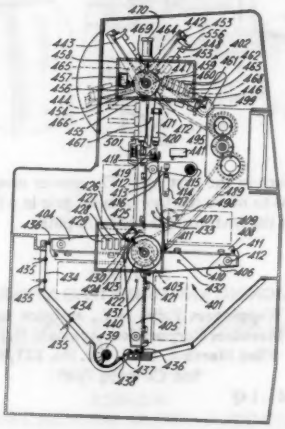
A live storage system in which pallets stored on racks are moved from a feed to a discharge station by a transfer trolley travelling on tracks below the racks and having a platform for raising and lowering pallets from and onto the rack, the transfer trolley carrying an auxiliary trolley for raising the platform both the transfer trolley and the platform being operated by a first linear induction motor with a second linear motor operating in opposition to the first motor to position the transfer trolley at each station and subsequently to return the transfer trolley along the track.

3,709,384

LOADING UNITS FOR MACHINE TOOLS

David T. N. Williamson; James Moffat, both of Hutchinson; William Wood, and Peter Holland, both of London, all of England, assignors to Molins Machine Company, Limited, London, England

Continuation of Ser. No. 721,034, April 12, 1968, abandoned. This application Dec. 14, 1970, Ser. No. 98,092
Claims priority, application Great Britain, May 5, 1967, 21,104/67
Int. Cl. B65g *1/06*
U.S. Cl. 214—16.4 R **18 Claims**



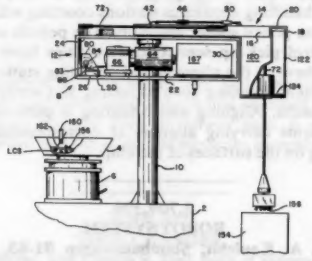
Workpiece-holding pallets and tool magazines are transferred between loaders and a numerically controlled machine tool by pushers on a horizontal beam movable lengthwise to effect such transfer, and movable transversely of its length between three positions at one of which the pushers can engage a pallet, and possibly also a tool magazine, at another of which the pushers can engage only a tool magazine, and at the third of which the pushers are clear of both pallets and tool magazines. The loaders are paddle members which can be rotatable to locate a selected paddle at a loading position.

3,709,385

PARTS CONVEYOR

Michael C. Klapes, Lynnfield, and Herbert N. MacRae, Beverly, both of Mass., assignors to Delta Engineering Corporation, Winchester, Mass.

Filed Aug. 5, 1971, Ser. No. 169,354
Int. Cl. B66c *23/84*
U.S. Cl. 214—17 C **11 Claims**



The invention is a conveyor for picking up parts from a supply station and transferring them to a parts delivering station or point of use. The conveyor comprises a pivotally mounted arm with pulleys supporting a cable from which depends a permanent magnet parts holder. Winch means comprising a motor and a reel connected to the cable are used to

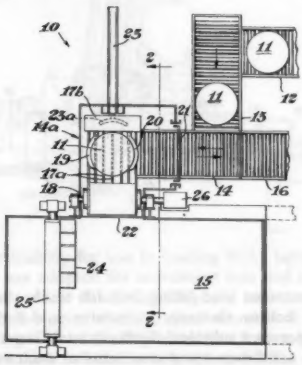
raise and lower the parts holder, and the cable and arm are so connected that winding and unwinding of the cable effects pivotal movement of the arm between the parts supply station and the parts delivering station.

3,709,386

CONTAINER FEED MECHANISM FOR REFUSE INCINERATOR

Robert D. Jones, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 6, 1970, Ser. No. 78,543
Int. Cl. B65g *47/82, 47/86*
U.S. Cl. 214—23 **2 Claims**



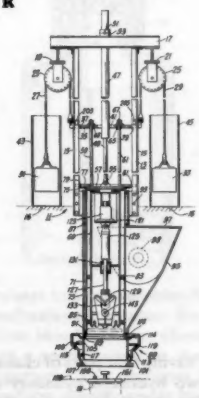
In one form of the apparatus a refuse-filled container is transported on a conveyor up to a pickup point adjacent to the kiln chute of the incinerator. A rotatable grid with a floor section raises upwardly through the conveyor, so that the floor section engages the container and lifts it free of the conveyor. Pivotal arm members clamp onto the filled container and hold it in place on the grid while the grid is rotated into the kiln chute to a point at which the refuse will empty out of the container and into the kiln chute. The grid is then rotated back to its starting position below the conveyor to deposit the empty container on the conveyor so that the container can be reused.

3,709,387

APPARATUS FOR HANDLING LIDS AND CHARGING COAL INTO COKE OVENS

Raymond C. Kinzler, and Albert G. Jonnet, both of Koppers Company, Inc., Koppers Building, Pittsburgh, Pa.

Filed June 24, 1971, Ser. No. 156,445
Int. Cl. B66c *13/00*
U.S. Cl. 214—35 R **7 Claims**



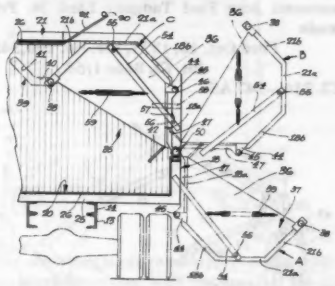
A larry car carrying a vertically movable lid lifting device is positionable over a row of charging lids on a coke oven. Fluid actuated cylinders actuate the pivoting cooperative lifting arms that grasp and raise a lid so that coal, moving by means of a screw feeder, flows through a closed conduit into the coking chamber. The apparatus is actuated then to replace and seat the lid.

3,709,388

SELF-LOADING REFUSE VEHICLE

Jacob J. Neufeldt, P.O. Box 33, Coaldale, Alberta, Canada

Filed Aug. 30, 1971, Ser. No. 175,982
Claims priority, application Canada, April 8, 1971, 110002
Int. Cl. B60p *1/04*; B65f *3/00*
U.S. Cl. 214—80 **10 Claims**



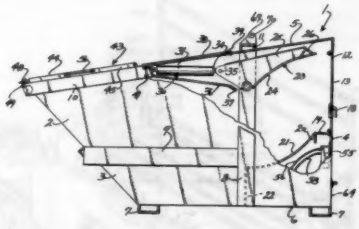
A vehicle having a side-loading bucket assembly. The bucket is mounted on arms attached to a shaft which pivots to move the bucket from a lower material-receiving position to an upper material-discharging position. The bucket is capable of limited rotation with respect to its mounting arms when it reaches the discharging position in order to compress the material in the vehicle. A locking mechanism normally holds the bucket in a fixed position with respect to its mounting arms and this mechanism is automatically released when the bucket reaches the discharging position. A hold down bar is normally positioned to retain material in the vehicle and is retracted out of the path of the bucket as it reaches its material-discharging position.

3,709,389

REFUSE CONTAINER

Douglas C. Steltz, Brookfield, Wis., assignor to Portec, Inc., Waukesha, Wis.

Filed Jan. 28, 1971, Ser. No. 110,546
Int. Cl. B65f *1/12*
U.S. Cl. 214—82 **5 Claims**



A refuse container for collecting refuse and adapted to be periodically upended to discharge the refuse into the body of a truck or other carrier for removal from the site. The refuse container is a closed bin having a charging opening in one end to receive the refuse and having a discharge opening in the opposite end. Both openings are enclosed by doors. The refuse is compacted within the container by a compactor mounted to sweep past the charging opening and move the refuse toward the discharge end of the container. The operating mechanism

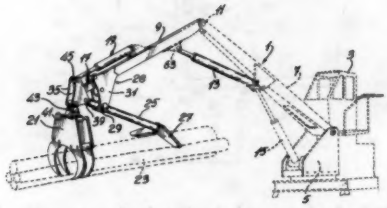
for the compactor is tied in with a switch at the charging opening and arranged so that the compactor cannot be operated unless the charging door is closed. The container is unloaded by a truck which acts to upend the container and discharge the refuse through the discharge opening into the body of the truck. A remote control unit is incorporated with the operating mechanism for the compactor enabling the compactor to be operated when the container is in the upended position to aid in discharging the refuse from the container into the truck body.

3,709,390

HEEL BOOM CONSTRUCTION

Jean Paul Tanguay, Saint Prime, Quebec, Canada, assignor to Placements Jean Paul Tanguay Ltee, St. Prime, Quebec, Canada

Filed Oct. 18, 1971, Ser. No. 190,345
Int. Cl. B66c 1/68
U.S. Cl. 214—147 AS **11 Claims**



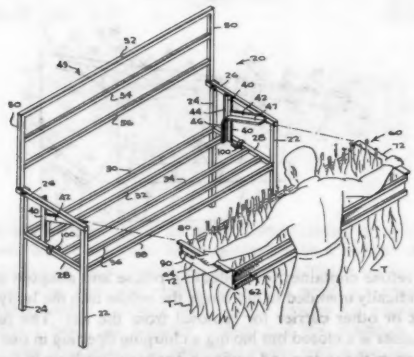
A heel boom construction for a log-handling apparatus, the construction comprising a hollow boom section and an arm telescopically mounted in the boom section and having a grapple at the outer end for the handling of logs. A heel bar provided at one end with a heel member applicable against the logs to be handled is mounted at the other end to the outer end of the arm for pivotal movement about an axis transverse to the longitudinal axis of the arm. A bracket fixed at the outer end of the boom section has a bearing and guiding block mounted thereon for pivotal movement about an axis transverse to the axis of the boom section. The heel slidably extends through the bearing and guiding block.

3,709,391

TOBACCO STRIPPING STAND ASSEMBLY

Allen McMillan, Enigma, Ga., assignor to Bomac Manufacturing Corporation, Enigma, Ga.

Filed March 11, 1971, Ser. No. 123,160
Int. Cl. A24b 1/06
U.S. Cl. 214—300 **5 Claims**



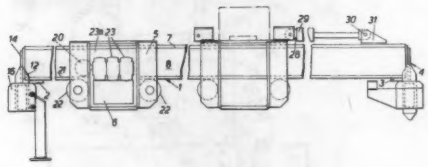
A stand is provided having a guide slot on each end for receiving flanges on each end of a U-shaped tobacco curing rack for releasing a tobacco retaining bar on the rack upon insertion of the rack in the stand and with a stripping gate means for stripping tobacco from tines on the rack as the rack is removed from the stand.

3,709,392

LIFTING APPARATUS

John Kinross, Aylesbury, England, assignor to Lancer Boss Limited, Leighton Buzzard, Bedfordshire, England

Filed Aug. 31, 1970, Ser. No. 68,246
Claims priority, application Great Britain, Sept. 2, 1969, 43,432/69
Int. Cl. B66f 9/14
U.S. Cl. 214—620 **7 Claims**



A container load lifting fork lift truck attachment having spaced hollow elements to receive said forks and through which passes a substantially horizontal frame element having double cantilever transverse arms at each end thereof with lockable container engaging devices at their end portions, power operable means being provided to cause relative movement between frame element and forks and between the fork receiving elements and the forks and for locking and unlocking the container engaging devices.

3,709,393

LIFT TRUCK MAST

Archie L. McGehee, Topeka, Kans., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Jan. 7, 1971, Ser. No. 104,683
Int. Cl. B66f 9/06
U.S. Cl. 214—674 **10 Claims**

A lift truck mast having four pairs of channels nestled within each other with two hydraulic cylinders and lift chains to operate as expansion units for extending the mast to its maximum height.

3,709,394

LOADING TOOL HAVING A LOADING FORK

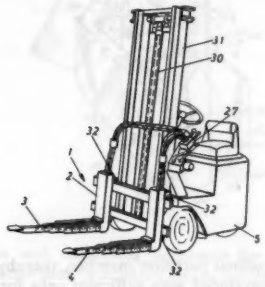
Bengt Sigurd Lennart Strandberg, and Maj Strandberg, both of Hudiksvall, Sweden, assignors to Hiab-Foco Aktiebolag, Hudiksvall, Sweden

Filed Oct. 28, 1970, Ser. No. 84,558

Claims priority, application Sweden, Oct. 29, 1969, 14772/69

Int. Cl. B65g 67/00

U.S. Cl. 214—750 3 Claims



A device, particularly for use in loading forks having two fork legs which are adapted for movement into and out of a stand frame and which consist of hingedly interconnected chain links with the pivot shafts thereof situated at a level above the abutting sides of the links such that from a horizontal position the links are foldable only upwards. The characteristic features of the device are that each chain link comprises two side pieces between which extend the link pivot shafts and between which each pivot shaft supports a roller, and that one arcuate guide is provided in the stand frame for each link chain for supporting the rollers of the chain links positioned closest to the stand frame and for guiding the link chain in lateral direction, when the link chain is being retracted into the stand frame.

3,709,395

CLOSURE FOR CONTAINERS

Timothy A. Brennan, Andover, Mass., and Elmer R. Green, Lowell, Mass., assignors to Hospital Service Technology Corporation, North Andover, Mass

Filed July 1, 1971, Ser. No. 158,861

Int. Cl. B65b 41/02

U.S. Cl. 215—38 R 3 Claims

The invention relates to a cap assembly for a biological culture container, preferably a container for the cultivation of microorganisms from blood samples, where the cap assembly includes a cap with a central aperture. A rubber grommet is situated in the aperture. The grommet is symmetrical, is dimensioned to perform reliably under high vacuum or high pressure within the container. It may also be provided with a recess to facilitate penetration by a hypodermic needle or syringe.

3,709,396

COLLAPSIBLE CARGO CONTAINER

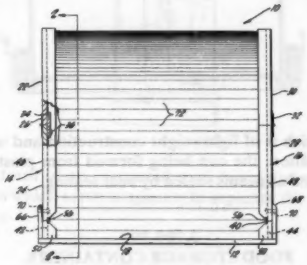
Hayward C. Cole, deceased, late of 23225 Carlow Road, Torrance, Calif. (by L'Vina Cole, executrix)

Continuation of Ser. No. 56,167, July 8, 1970, abandoned.

This application April 23, 1971, Ser. No. 137,009

Int. Cl. B65d 7/12; B65j 1/02

U.S. Cl. 220—1.5 17 Claims



A collapsible container is provided with two side walls, each formed in two hinged sections, with the lower of the sections being hinged to a base. These walls are capable of collapsing from an erect position inwardly to overlie the base. With the side walls erect, a pair of flexible end walls of slat construction is removably disposable in tracks bounding the periphery of the side walls. The slats are hinged together and have overlapping adjacent edges to present a weather barrier. The tracks and end walls are provided with mating flanges and grooves to effect a structural interlock in the erected container. Alternately, rollers disposed in a grooved track may be used to effect a structural interconnection of the end walls through the side walls. A removable ridge beam is disposed intermediate the tracks to provide a guide which tracks or untracks the end walls in their installation and removal as well as in the opening and closing of the container.

3,709,397

BUTTER CONTAINER OR THE LIKE

Robert Daenen, Erenbodegem, 22, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.

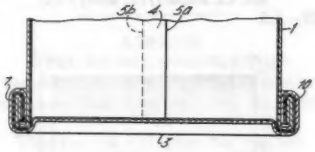
Filed March 18, 1969, Ser. No. 808,182

Int. Cl. B65d 11/10, 43/08

U.S. Cl. 220—42 A 2 Claims

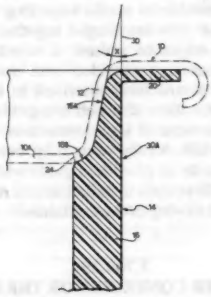
This invention is primarily directed to a supporting container or base for butter or the like that includes a recessed surface portion surrounded by a peripheral outwardly extending ledge and outside sealing surface adapted to mate with a cover having peripheral dimensions suitable to produce tapered fit between the two mating surfaces.

3,709,398
CONTAINER
Gustav Fuhrmann, Kempten, Allgau, Germany, assignor to Lever Brothers Company, New York, N.Y.
Filed Aug. 21, 1970, Ser. No. 65,911
Claims priority, application Germany, Sept. 2, 1969, P 19 44 554.6
Int. Cl. B65d 7/42
U.S. Cl. 220—67 **4 Claims**



A can which is of lightweight construction and suitable for heat sterilization, the can being formed from plastics coated aluminum and all seams sealed by heat sealing.

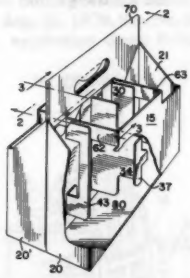
3,709,399
FOOD STORAGE CONTAINERS
Giovanni Nughes, Via Giacomo Leopardi 22, Monza, Milan, Italy
Filed July 21, 1971, Ser. No. 165,246
Claims priority, application Italy, Aug. 11, 1970, 69772A/70
Int. Cl. B65d 7/42
U.S. Cl. 220—67 **6 Claims**



A food container having an injection moulded polypropylene body with an open end around which extends a circumferential flange to which a metal lid having a frusto-conical annular wall is attachable. The walls of the container are tapered in thickness near the open end to accommodate the outwardly flaring frusto-conical wall so that the wall can provide suitable support for the container wall during a seaming operation where the lid is seamed to the flange by means of a conventional tin can seaming machine.

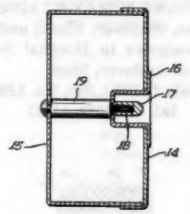
3,709,400
ARTICLE CARRIER
Edwin L. Arneson, Hillsdale, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.
Filed June 23, 1971, Ser. No. 155,755
Int. Cl. B65d 75/00
U.S. Cl. 220—113 **10 Claims**

A cellular bottle carrier formed from a single sheet of cut and scored paperboard or similar sheet material which is characterized by a multi-ply rigid, suspending and longitudinal partition member subdividing its interior into two halves and by sets of cross partition members for each half with the center cross partition member being excised from a panel forming a ply of the longitudinal partition member and being hinged at its free end to a side wall and the remaining cross partition elements of each set thereof being derived in part by cutting strap forming portions from the upper corners of the side wall which are integrally hinged to the longitudinal partition member and which have attached thereto the upper portions of full depth separating panels which are derived from



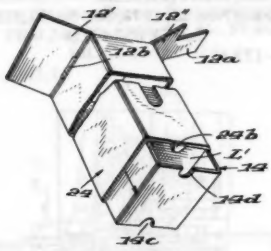
plies of the longitudinal partition member, thereby enabling the carrier to be produced with sufficient cells for 8 bottles and with partition panels providing substantially full depth separation of the bottles in adjoining cells.

3,709,401
TAMPER RESISTANT FASTENING APPARATUS
Leslie R. Walstrom, Excelsior, Minn., assignor to Ideavelopment, Inc., Minneapolis, Minn.
Filed Oct. 30, 1970, Ser. No. 85,391
Int. Cl. A47j 36/10
U.S. Cl. 220—55 C **5 Claims**



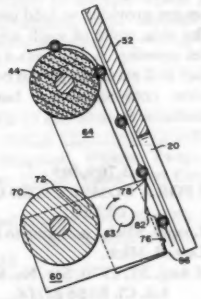
A fastening apparatus including a rachet-type tool adapted to transmit torque to a nut-type fastener. The tool includes a handle mounted to one or a plurality of tubular-type roller clutches which have the property of providing torque in only one direction. Openings in the handle are provided to enable a roller clutch to transmit unidirectional torque to the nut-type fastener and to allow the user to select the direction of this torque by selection of the appropriate opening. The particular configuration and material of the nut-type fastener is such that contact made by any device other than said tool for purposes of applying torque thereto would be reasonably detectable from subsequent examination of said fastener. A recessed portion of a fastened member is provided in which the nut-type fastener is attached to a complementary fastening member, said recessed portion being of special configuration adapted to receive the said tool for purposes of engaging the nut-type fastener while preventing access of commonly available tools.

3,709,402
LABEL PACKAGE ASSEMBLY
John Glenn Templeton, and Calvin W. Seitz, both of Grand Rapids, Mich., assignors to Rospatch Corporation, Grand Rapids, Mich.
Continuation-in-part of Ser. No. 718,770, April 4, 1968. This application April 23, 1970, Ser. No. 31,219
Int. Cl. B65h *1/06*
U.S. Cl. 221—33 4 Claims



Retention and dispersing apparatus for relatively small sheet-like items such as clothing labels, involving an elongated container retaining a stack of the items for individual controlled dispensing out one end.

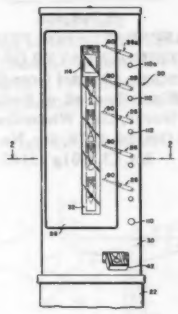
3,709,403
WEB CARRIED TOOTHPICK DISPENSER
Allen C. Harriman, Lewiston, Maine, assignor to Forster Mfg. Co., Inc., Wilton, Maine
Filed Aug. 5, 1971, Ser. No. 169,341
Int. Cl. B65h *5/28*
U.S. Cl. 221—70 8 Claims



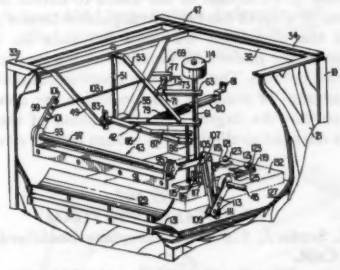
A device for dispensing wrapped toothpicks from a supply that is in the form of a continuous web of protective material within which the toothpicks are sealed, either singly or in pairs, in parallel spaced relation transversely of the web. When a sealed toothpick package is taken from the dispenser, the next toothpick package is brought to delivery position before the first toothpick or toothpick pair still sealed in its envelope, is detached from the web.

3,709,404
VENDING MACHINE
Eugene K. Dana, 2884 Colorado Avenue, Santa Monica, Calif.
Continuation-in-part of Ser. No. 766,088, Oct. 9, 1968, abandoned. This application Sept. 2, 1970, Ser. No. 68,957
Int. Cl. B65g *55/00*
U.S. Cl. 221—120 18 Claims

A vending machine having a rotatably mounted central column with a plurality of supports which carry merchandise to be vended. The merchandise is stripped from the supports one at a time by a stripping mechanism which is actuated by the customer. In one embodiment the merchandise is on a carrier in the form of an elongated card having rearwardly extending ears which serve as spacers to separate the carriers on the supports.



3,709,405
VENDING MACHINE FOR PERIODICALS HAVING ARCUATE PATH EJECTION
Charles G. Harris, 1301 Orange Road, Culpeper, Va.
Filed Oct. 29, 1970, Ser. No. 85,161
Int. Cl. B65h *3/24*
U.S. Cl. 221—209 21 Claims



A newspaper/magazine (periodical) vending machine which includes a feeder mechanism that rotates the item to be vended through an arc is disclosed. The feeder mechanism includes a carriage arm that is rotatably attached at one end to a fixed vertical shaft. The other end of the carriage arm supports a feeder shaft in vertical alignment. A paralleling arm parallels the carriage arm and moves therewith to prevent movement of the feeder shaft. A mechanical linkage, that includes a horizontal shaft having cranks at either end, a tension wire and a link, connects the carriage arm to an operating handle. When the operating handle is moved, the horizontal shaft rotates and causes the tension wire to move which in turn causes movement of the feeder shaft in an arcuate manner. A return spring is attached to the carriage arm to return the carriage arm to its normal position when the operating handle is released. In one embodiment of the invention, suitable for use with relatively thin magazines and newspapers, the feeder shaft has a weight attached to its upper end and a feeder foot attached to its lower end. The feeder foot has pins that project into the top newspaper/magazine of a stack of horizontally disposed newspapers/magazines. When the feeder shaft is moved by the operation of the operating handle, the top newspaper/magazine is moved and vended through a vending slot. In an alternate embodiment, a hook replaces the feeder foot and hooks the rear of the top newspaper/magazine. The alternate embodiment is suitable for use with relatively thick

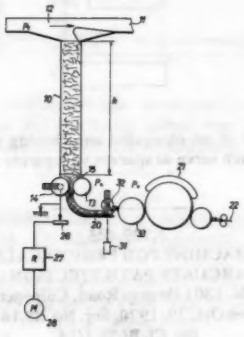
newspapers/magazines and includes an elevator to raise the stack each time an item is vended.

3,709,406

METHOD AND APPARATUS FOR PRODUCING AN EVEN CONTINUOUS LAYER OF FIBERS

Rolf Binder, Raterschen; Christof Grundler, and Rudolf Wildboltz, both of Winterthur, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Oct. 14, 1970, Ser. No. 80,656
Int. Cl. D01g 15/40
U.S. Cl. 222—55 22 Claims



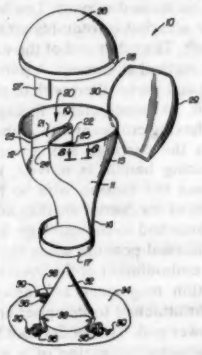
The fiber arrangement removed from the feed chute is monitored down stream of the chute to detect deviations in thickness or mass of the fiber arrangement from a preset value so that the deviations are used to cause an increase or decrease of the pneumatic pressure acting on the top of the fiber flock column. The change in pressure results in a change in the amount of pressure drop to which the column is subjected so that the degree of condensation of the column is likewise changed to eliminate or reduce further deviations.

3,709,407

ADJUSTABLE WIG FORM

Jack C. Sanford, 125 West Aeroplane Boulevard, Big Bear City, Calif.

Filed Dec. 8, 1971, Ser. No. 205,899
Int. Cl. D06c 15/00
U.S. Cl. 223—66 7 Claims



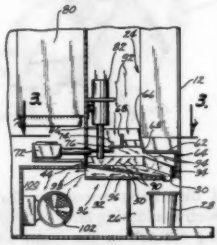
This disclosure relates to an adjustable wig form approximately simulating a human head for use in styling and drying wigs. The structure for the wig form comprises a hollow housing provided with an expandable brow portion, a set of crown pieces for fitting on the upper end of said housing, and a set of head enlarging attachments for the back of the housing. The housing can be adjusted and fitted with a selected one of the crown pieces and enlarging attachments to accomodate any wig size. The wig form is constructed of a multi-layer wire screen fabric formed of a single sheet of fine mesh screen.

3,709,408

BEVERAGE DISPENSING MACHINE

Martelle J. Syverson, Albert Lea, Minn., assignor to Fountain Industries, Inc., Albert Lea, Minn.

Filed Nov. 25, 1970, Ser. No. 92,722
Int. Cl. B67d 5/56
U.S. Cl. 222—129.4 8 Claims



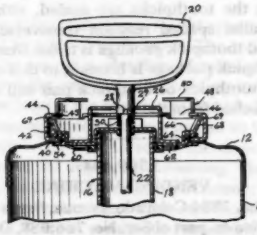
A machine for dispensing hot beverages including a dry product dispenser having a metering scoop reciprocal for feeding into a mixing chamber also receiving hot water. An exhaust system is in communication with the mixing chamber and draws air through an opening in the scoop when it is in its open position and draws vapor from the hot water conduit and mixing chamber thereby maintaining the dry product in the product dispenser in a dry condition. A pair of mixing chambers are provided having outlet openings registering with a common opening in a lower support housing and different dry product dispensers are provided to feed into the separate mixing chambers. The side walls of each mixing chamber converge at the outlet opening. A passageway is provided under the mixing chamber and extends upward over the forward end thereof to provide communication between the mixing chamber and the exhaust system.

3,709,409

SEAL MEANS FOR A COMPRESSED GAS SPRAYING DEVICE

Dean E. Collins, Lowell, Mich., assignor to Root-Lowell Manufacturing Co., Lowell, Mich.

Filed Aug. 31, 1970, Ser. No. 68,421
Int. Cl. B65d 83/14
U.S. Cl. 222—402 7 Claims



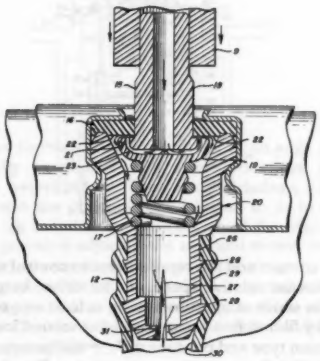
A means of sealing a removable pump element to the air tank of a spraying device. An annular flexible seal is positioned around the opening into the tank. The pump element is inserted through the tank opening and includes an annular cap part which engages the seal. The tank includes a lip which

overlies the marginal edge of the cap of the pump element. When the tank is placed under pressure by actuation of the pump element, the cap of the pump element is forced upwardly against the lip of the tank with the seal remaining in sealing engagement with the cap.

3,709,410
AEROSOL VALVE WITH DIFFERENTIAL FLOW CONTROL RATE

Ernest R. Cunningham, Libertyville, Ill., assignor to Barr-Stalfort Company, Division Pittway Corporation, Niles, Ill.

Filed July 30, 1970, Ser. No. 59,464
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.16 **7 Claims**

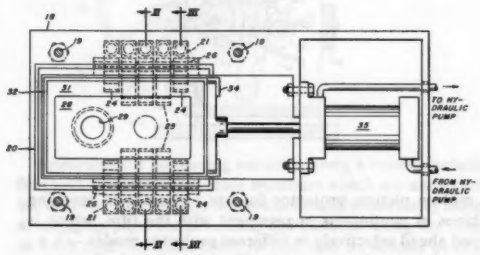


This invention relates generally to a new and improved valve associated with aerosol type containers, for example, and more particularly to a valve which permits more rapid filling of a small-orificed valve through the use of a unidirectional, pressure-actuated, expanding slot valve body.

3,709,411
SLIDING GATE CLOSURE ASSEMBLY FOR BOTTOM-POUR TEEMING VESSELS

James Thomas Shapland, Wilkins Twsp., Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburg, Pa.

Filed Oct. 14, 1970, Ser. No. 80,541
Int. Cl. B22d *37/00*
U.S. Cl. 222—512 **5 Claims**



A reciprocable slidable gate closure assembly for bottom-pour teeming vessels. The gate is of two-piece construction, each piece being independently supported by spring-loaded levers. The purpose is to assure that the outlet of the vessel may be closed effectively even though a fin forms between the gate and the vessel bottom.

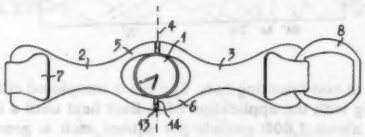
ERRATUM

For Class 223—66 see.
Patent No. 3,709,407

3,709,412
BRACELET-WATCH

Jacques Broido, 18, Chemin Challendin, Geneva, Switzerland

Filed March 1, 1971, Ser. No. 119,786
Claims priority, application Switzerland, March 17, 1970, 3956/70
Int. Cl. A44c *5/14*
U.S. Cl. 224—4 E **5 Claims**

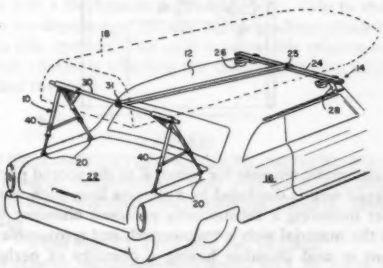


The bracelet is formed of two parts hinged on the watch, these two parts being hinged along the same axis. Pivots for the hinged parts are situated on both sides of the watch and can be rigidly fixed to the watch or be integral with the latter and one of the pivots can be combined with the rewinding stem of the watch. The two parts of the bracelet can each have one end in the form of a fork, whose branches encompass the watch. Each pivot can be rigidly fixed to one of the parts of the bracelet and have one end engaged in a recess of the watch.

3,709,413
CAR TRUNK RACK

Ralph R. Nelson, 436 Lingle Avenue, Lafayette, Ind.

Filed March 4, 1971, Ser. No. 120,939
Int. Cl. B60r *9/08*
U.S. Cl. 224—42.1 H **16 Claims**



Apparatus for carrying long articles, such as a boat or ladder, on an automobile. An A-frame trestle is mounted on the rear deck with its feet in the rain gutter grooves at the sides of the trunk opening in the deck, to form a rear support, and a crossbar is mounted by suction cups or other conventional means on the car roof to provide a front support. The two supports may be connected by a lengthwise bar.

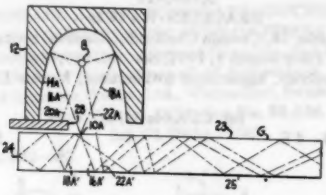
3,709,414
DIRECTIONAL CONTROL FOR THERMAL SEVERING OF GLASS

John R. Dahlberg, Jeannette; James L. Oravitz, Jr., Chewsick, and Edmund R. Michalik, West Mifflin, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 15, 1970, Ser. No. 72,353
Int. Cl. B26f *3/14*
U.S. Cl. 225—2 **12 Claims**

This invention relates to non-contact thermal severing of glass and includes methods and apparatus for altering at least

some of the radiation from a thermal source so that a temperature profile that would ordinarily otherwise tend to be asymmetrical becomes symmetrical about an intended path of cut. The problem of asymmetrical temperature profiles occurs, for



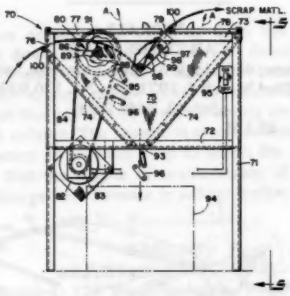
example, in non-bisecting cuts. The cut is completed either by continuing with the application of radiant heat until a tensile stress of about 1,000 pounds per square inch is generated within the glass, or by applying a bending moment about the thermal score.

3,709,415

AUTOMATIC STRIPPING MACHINE

Alex Nagy, Aurora, Ohio, assignor to Betty M. Nagy, Aurora, Ohio

Filed Dec. 18, 1970, Ser. No. 99,539
Int. Cl. B26f 3/00
U.S. Cl. 225—97 **7 Claims**



An automatic stripper for removal of die scored parts from a material web is disclosed in a process line, such automatic stripper including a substantially enclosed chamber through which the material web is transversed, and a rotatable beater element in said chamber having a plurality of peripherally spaced radially outwardly extending blades adapted to engage such die scored parts to separate the same from the web. The material web feed path past the beater element may variably be controlled by a tension device having a plurality of horizontally and vertically offset tension bars around one of which the web is directed.

3,709,416

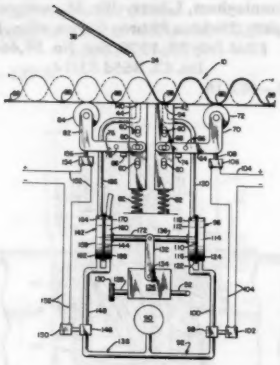
SPEED REGULATING SYSTEM

Bernard P. Kunz, 4981 S. Clarkson Street, Englewood, Colo.

Filed Aug. 18, 1971, Ser. No. 172,745
Int. Cl. B65h 23/18
U.S. Cl. 226—2 **13 Claims**

Method is applied to apparatus for depositing a web-carrying film on a forming belt in which the film must be in contact with the belt at a first locus and must be out of contact at a second, upstream locus. Method comprises sensing lack of contact at first locus and increasing relative speed of film in response to signal, and sensing undesired contact at second locus and decreasing relative speed in response to signal.

Apparatus includes forming belt driven at constant speed through receiving station and web-carrying film driven at substantially constant speed related to belt speed with guide means to deposit film on belt at receiving station. First sensor at first locus in receiving station can sense lack of film contact with web and has servo system to control speed adjuster to increase relative speed of film drive. Second sensor at second locus in receiving station upstream of first locus can sense un-



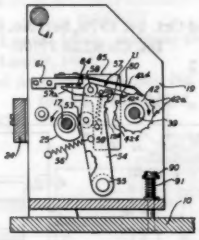
desired film contact and has servo system to control speed adjuster to decrease relative speed of film drive. In preferred form, belt has series of apertures along at least one margin to be covered by film at first locus but not at second locus. Sensors are vacuum type and produce differential pressure signals at two loci indicating contact or no contact. Signals actuate servo motors to control speed adjuster.

3,709,417

PICTURE PROJECTOR

Henry L. Brill, Flushing, N.Y., assignor to E. R. E. Laboratory, Inc., West Orange, N.J.

Filed June 1, 1971, Ser. No. 148,403
Int. Cl. G03b 1/24
U.S. Cl. 226—76 **14 Claims**



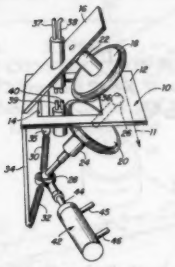
A motion picture projector for use especially in teaching machines in continuous engagement with the film, which is stepped ahead selectively in different projector modes — i. e., motion picture, slow motion, still picture, single frame-to-frame and is driven continuously at fast speed in different scan modes. The step movement of the sprocket wheel is produced by a high speed cam-actuated pawl and ratchet mechanism through a one revolution spring clutch, and scanning movement is produced by a separate drive motor in continuous coupling engagement with the sprocket wheel. By special design great indexing accuracy and quiet operation are achieved.

3,709,418

WEB ALIGNMENT DEVICE

Willard G. Sylvester, Concord; Ira D. Boynton, Lexington, and Robert H. Bode, Wenham, all of Mass., assignors to The H. D. Lee Company, Inc., Shawnee Mission, Kans.

Filed March 26, 1971, Ser. No. 128,337
Int. Cl. B65h 25/26
U.S. Cl. 226—17 10 Claims



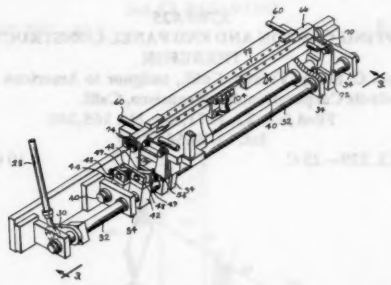
A device for maintaining alignment of an edge of a web in substantially parallelism with a predetermined path along which the web is moved. The device includes a pair of guide wheels which are positioned and biased so as to engage the web in a nip between the peripheries of the wheels. A fluid stream is provided adjacent the nip, and means are provided for generating a signal accordingly as the stream is obstructed or not by stream. A motor is provided, responsive to the signal for effecting pivotal movement of the axle of one of the wheels relative to the other of the wheels, so as to tend to maintain the desired parallelism.

3,709,419

ADJUSTABLE FEED APPARATUS FOR STRIP MATERIAL

John F. Varga, Harbert, Mich., assignor to Weldon Tool and Engineering Co., Bridgman, Mich.

Continuation-in-part of Ser. No. 38,251, May 18, 1970, abandoned. This application March 8, 1971, Ser. No. 121,747
Int. Cl. B65h 17/40
U.S. Cl. 226—67 17 Claims



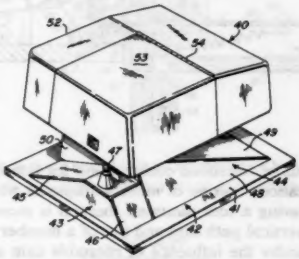
Apparatus for advancing material along a course including first and second reciprocable members which are each shiftable between first and second positions and which carry material engaging parts for advancing the material along the course as each member shifts from its first into its second position. The material engaging parts carried by the second member are shiftable relative to the second member into and out of a material engaging position. The members reciprocate simultaneously with the second member traveling further between its first and second positions than the first member travels between its first and second positions so as to cause the material engaging parts carried by the second member when positioned in their material engaging position to advance the material a greater distance along the course than the material engaging parts carried by the first member advance the material. A power unit is provided to shift the material engaging parts carried by the second member into and out of their material engaging position without interrupting the advance of the material.

3,709,420

EASY-ACCESS PINNING MACHINE

Harold N. Grushon, Dayton, Ohio, assignor to Monarch Marking System, Inc., Dayton, Ohio

Filed Dec. 30, 1970, Ser. No. 102,686
Int. Cl. B27f 7/02
U.S. Cl. 227—7 27 Claims



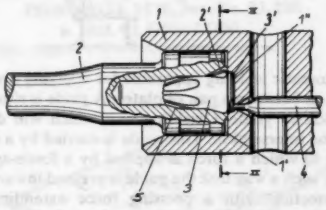
There is disclosed an easy-access pinning machine for pinning tickets to merchandise. The machine is sufficiently open to enable merchandise to be inserted into the machine to the desired depth. The machine has a die and an anvil or plunger between which one ticket at a time is fed by a ticket feeder mechanism. The ticket feeder mechanism, disposed in cantilevered relationship over a side access opening of a machine, is adjustable to feed different size tickets. A pin magazine and a mechanism for feeding a pin strip to the pin magazine are disposed on the side of the machine which is opposite the side opening. The anvil is adjustable relative to the die without adversely affecting the drive connection between a driver and the anvil.

3,709,421

CARTRIDGE-ACTUATED FASTENER-DRIVING TOOLS

Herbert Kolmar, Burgoberbach near 165, Germany, assignor to Impex-Essen Vertrieb Von Werkzeugen GmbH, Ansbach, Germany

Filed May 17, 1971, Ser. No. 143,823
Claims priority, application Germany, May 30, 1970, P 20 26 570.7
Int. Cl. B25c 1/14
U.S. Cl. 227—10 3 Claims



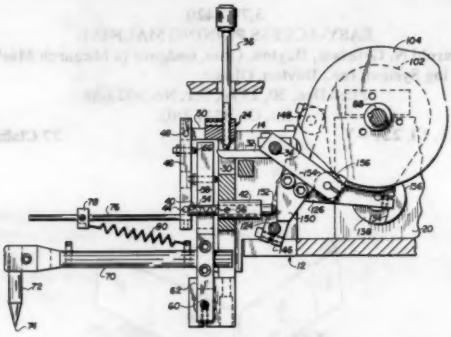
A cartridge-actuated tool adapted to explosively drive fasteners is provided which ejects the actuating cartridge into a propulsion chamber while controlling cartridge rupture so as to avoid tool damage.

3,709,422

WIRE BONDING MEANS

John C. Diepeveen, 1737 Kimberly Drive, Sunnyvale, Calif.

Filed April 14, 1971, Ser. No. 133,932
Int. Cl. B23k *1/20*
U.S. Cl. 228—13 22 Claims



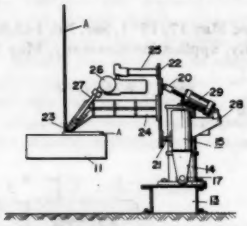
Apparatus of improved construction for bonding a wire to several locations on one or more workpieces wherein a slide member having a tool mounted thereon is movable along a generally vertical path into and out of a number of operative positions under the influence of rotatable cam means whose movement is transferred by a number of levers to the slide member. One of the levers is constructed to provide a "knee-action" effect to assure that the lever will remain in engagement with an adjustable abutment surface associated with a particular cam to eliminate vibration of the slide member as it moves between certain of the operative positions thereof. A wire cutting and pulling unit operates to cut the wire after the last bond and to separate the excess wire projecting from such bond.

3,709,423

AUTOMATIC WELDING APPARATUS

Masaaki Hano; Takeshi Kiyotake, and Minoru Oike, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1970, Ser. No. 63,100
Claims priority, application Japan, Aug. 14, 1969, 44/64031
Int. Cl. B23k *19/00*
U.S. Cl. 228—44 12 Claims



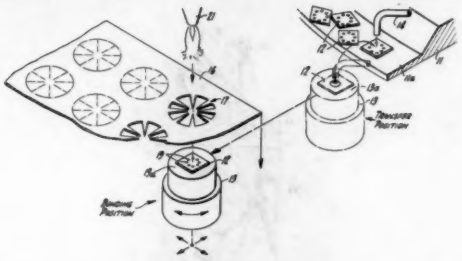
An automatic welding apparatus for applying a weld to the intersection between a pair of plates. A guide is situated at the intersection to guide a welding unit which will deposit the weld at the intersection. This guide is carried by a supporting structure to which a force is applied by a force-applying assembly in such a way that the guide is pressed inwardly toward the intersection with a pressing force extending along a pressing line which bisects the angle defined between the plates which are welded to each other. The force-applying assembly applies to the supporting structure a pair of mutually perpendicular component forces, and the pressing force with which the guide is pressed into the intersection is the resultant of these component forces.

3,709,424

INTEGRATED CIRCUIT BONDER

Joseph M. Drees, Saratoga, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Feb. 19, 1971, Ser. No. 116,896
Int. Cl. B23k *19/00*
U.S. Cl. 228—44 17 Claims



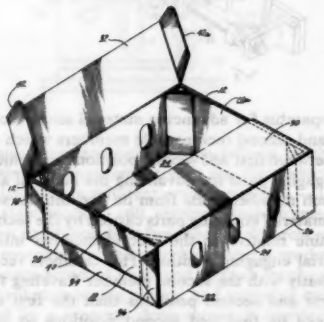
A bonder for sequentially bonding a plurality of semiconductor bodies carrying integrated circuits and having contact pads thereon to a respective plurality of lead structures formed in a sheet of material. The sheet of material is retained in a frame which is sequentially indexed to position each of the lead structures in a bonding position. Semiconductor bodies are picked up from storage by a pick up arm and placed on a transport arm. The transport arm is adapted to then shift to a bonding position whereby the semiconductor body on the transport arm is approximately coaxially aligned with the lead structure in the bonding position. Optical viewing apparatus is provided for viewing the lead structure in the bonding position and the semiconductor body retained on the transport arm in the bonding position. The transport arm is mounted on a micromanipulator apparatus by means of which the transport arm and hence the semiconductor body carried thereon may be rotated or translated in order to align the contact pads on the semiconductor body with the lead structure. A clamp is provided for clamping the lead structure to the semiconductor body after alignment and a bonding energy source such as a torch is moved into position to bond the semiconductor body to the lead structure.

3,709,425

SHIPPING CARTON AND END PANEL CONSTRUCTION THEREFOR

William C. Stapp, Fresno, Calif., assignor to American Forest Products Corporation, San Francisco, Calif.

Filed July 22, 1971, Ser. No. 165,248
Int. Cl. B65d *13/00*
U.S. Cl. 229—23 C 10 Claims



A shipping carton and end panels therefor and the method of manufacturing same have been disclosed in which extra resistance to crushing is provided by forming the end panels of

paper-faced wood veneer which are routed to permit two segments at each end to be folded over and fastened together to form corner posts of triangular cross-section. The bottom, sides and top may be of corrugated paper and are formed with flaps which are glued to the outside faces of the end panels. Alternatively, the bottom, sides and top may be formed of the same material as the end panels. A modification uses a similar technique to form end panels having both vertical and horizontal posts or rails for stiffening in both planes.

3,709,426

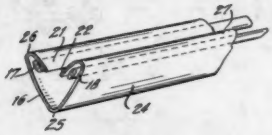
METHOD AND CONSTRUCTION FOR PACKAGE

Robert D. Farkas, 772 Prospect Street, Westfield, N.J.

Filed May 11, 1970, Ser. No. 36,066

Int. Cl. B65d *31/14*

U.S. Cl. 229—62.5 **2 Claims**



A container and a closure means are formed as a unitary structure constructed of pliable or bindable sheet material. The closure means comprises a pair of flaps lightly biased to closed position, and disposed so that an attempt to remove the container contents before opening the closure means will result in generating forces which assist the biasing means in maintaining the flaps closed. These flaps are also positioned so that upon manual manipulation, without the aid of a tool, the flaps are deformed and become separated to open the closure means and permit the contents of the container to be poured or squeezed out.

3,709,427

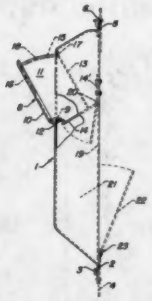
SELF-CLEANING ASHTRAY WITH COLLECTING HOPPER

Eugene R. McGregor, Morris, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 16, 1971, Ser. No. 199,160

Int. Cl. B65d *91/00*

U.S. Cl. 232—43.1 **8 Claims**



A tilting bin-type ashtray or receiver section is provided with a self-opening bottom member such that each time the section is closed there is an opening and dumping of waste material into a lower "one-day capacity" collecting hopper. The bottom member for the ashtray is separated from the wall portions thereof and is spring biased in a manner to be deflectable downward from an attachment point at the rear of the ashtray housing, whereby the movable tray will have a closed bottom when tilted open and an open bottom portion as the tray is tilted in and closed.

3,709,428

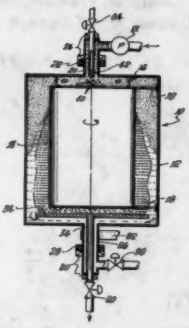
CENTRIFUGE VENT

Jack W. Abbott, Huntington Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed April 13, 1970, Ser. No. 27,926

Int. Cl. B04b *11/00*

U.S. Cl. 233—19 A **5 Claims**



A continuous flow, annulus type centrifuge which includes a vent to provide an escape path for air or gas accumulation.

3,709,429

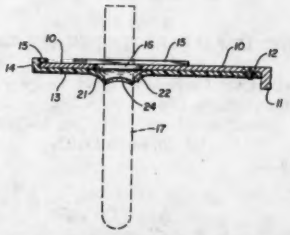
CENTRIFUGES

Donald J. McKenzie, and Ernest F. Friedly, both of 979 Miller Street, Denver, Colo.

Filed Oct. 19, 1970, Ser. No. 81,717

Int. Cl. B04b *9/12*

U.S. Cl. 233—26 **4 Claims**



A centrifuge having a circular head horizontally mounted on a vertical rotable shaft with a resilient test tube holder mounted adjacent the head having radially disposed openings in alignment with openings in the head for frictionally engaging test tubes inserted through the openings.

3,709,430

BIORYTHMIC INDICATOR

Bernard John Matthews, Palo Alto, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 23, 1970, Ser. No. 83,428

Int. Cl. G06c *27/00*

U.S. Cl. 235—109 **4 Claims**

Three theoretical biorythmic body cycles of different length are normally plotted on charts in graph form. In the invention each cycle is represented by a separate dial with pointer, the

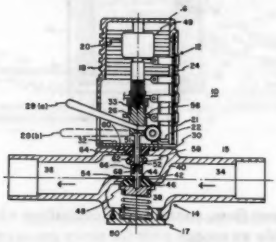
pointers being coupled by drive gears of different ratios to the pointer on a master dial.

3,709,431

ZONE CONTROL VALVES

Andrew Willis Channell; Satoru Shikasho, both of Chicago, and Gilbert Robert Sommer, Freeport, all of Ill., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 31, 1969, Ser. No. 872,875
Int. Cl. F16k 31/00
U.S. Cl. 236—68 R 6 Claims



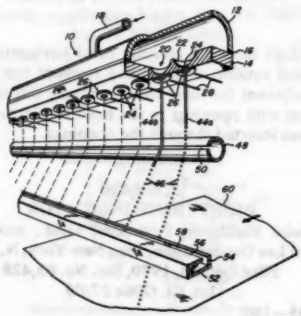
The invention is concerned with zone control valves of the type employed in hydronic temperature control systems. The valve incorporates a molded elastomeric bellows and sealing means for controlling temperature determining fluid flow. The valve can be constructed by simplified manufacturing techniques and can be maintained more readily in the field, thus providing substantial cost advantages.

3,709,432

METHOD AND APPARATUS FOR AERODYNAMIC SWITCHING

John A. Robertson, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed May 19, 1971, Ser. No. 144,841
Int. Cl. B05b 13/02
U.S. Cl. 239—4 12 Claims



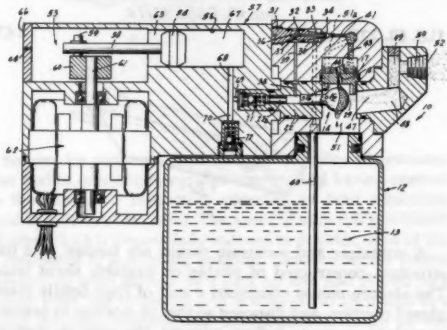
Filaments of fluid are stimulated with transducers to cause them to break up into uniformly spaced drops. The lengths of the filaments before they break up into drops are regulated by controlling the stimulation energy supplied by the transducers, with high amplitude stimulation resulting in short filaments and low amplitude stimulation resulting in long filaments. A flow of air is generated across the paths of the fluid at a point intermediate the ends of the long and short filaments. The air flow affects the trajectories of the filaments before they break up into drops more than it affects the trajectories of the drops themselves. Therefore, by controlling the lengths of the filaments the trajectories of the drops can be controlled, or switched, from one path to another. In a non-contacting coating system this provides means for directing some drops into a catcher while allowing other drops to be applied to a receiving member.

3,709,433

METHOD OF AND APPARATUS FOR GENERATING MIST

Ronald F. Obergefell, Richmond Heights, and Edward E. Kish, Cleveland Heights, both of Ohio, assignors to Handaille Industries, Inc., Buffalo, N.Y.

Filed March 25, 1971, Ser. No. 128,012
Int. Cl. B05b 7/30
U.S. Cl. 239—8 10 Claims



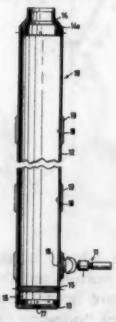
A method of producing a fine mist or aerosol by means of a pressurized-gas operated mist generating head in which a foam or bubbles of liquid are supplied to the mist generating head. Apparatus for producing a mist or aerosol by means of said method.

3,709,434

PROCESS AND APPARATUS FOR COATING OBJECTS WITH POWDERY SUBSTANCES

Otto Gebhardt, Fellbach; Fred Luderer, and Karl-Heinz Stahlschmidt, both of Wiler Zum Stein, all of Germany, assignors to Firma Ernst Mueller K.G., Hofen near Winnenden, Germany

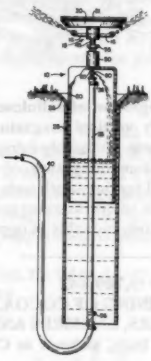
Filed April 21, 1971, Ser. No. 135,868
Claims priority, application Germany, April 24, 1970, P 20 20 055.9
Int. Cl. A01n 17/02; A62c 1/12
U.S. Cl. 239—8 23 Claims



A powder spraying apparatus comprises a finishing container and a spraying system attached thereto. The spraying system comprises a nozzle portion and a connector portion which communicates the nozzle with the finishing container. The finishing container and the connector portion each have

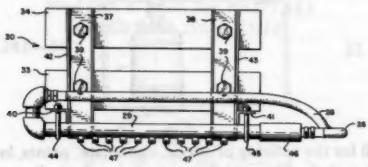
an independently controlled supply of compressed air for keeping powder particles in a fluidized, or suspended, state to prevent the particles from lumping together. The nozzle is operated by an additional supply of compressed air which creates a suction force in a manner allowing the nozzle to aspirate powder from the finishing container. By switching off the supply of compressed air to the connector portion just prior to switching off the nozzle air, the powder within the connector portion will lump, thus preventing an undesirable discharge through the nozzle under the influence of residual pressure in the finishing container. An attachment is provided for the nozzle which serves to change the shape of fluid flow therefrom and which has air flow means for preventing the particles from lumping up therein.

3,709,435
PROJECTABLE LAWN SPRINKLER
Kerney T. Sheets, P.O. Box 637, Duplessis, La.
Filed April 1, 1971, Ser. No. 130,253
Int. Cl. B05b *3/04*
U.S. Cl. 239—206 **20 Claims**



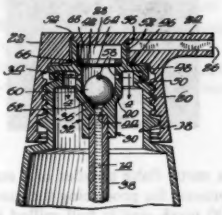
A projectable lawn sprinkler which rises automatically from the ground when water pressure is applied to the sprinkler. The sprinkler includes a circular casing sunken in the ground, a hollow cylinder which floats upward within the circular casing when water pressure is supplied to the sprinkler, and a rotating nozzle attached to the top of the hollow cylinder.

3,709,436
HIGH PRESSURE JET CLEANING DEVICE
Willard F. Foster, Alden, N.Y., assignor to C. H. Heist Corporation, Buffalo, N.Y.
Filed Jan. 6, 1971, Ser. No. 104,277
Int. Cl. B05b *9/02*
U.S. Cl. 239—287 **8 Claims**



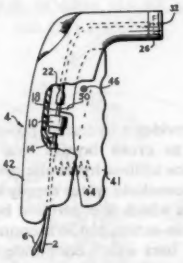
A machine for cleaning rubber tire marks from the surface of an airport runway by means of high pressure jets of water including a frame adapted to be mounted on the front of a fork lift, a manifold on the frame, a plurality of nozzles on the manifold for supplying fan-shaped jets of liquid, said nozzles being spacedly mounted lengthwise of the manifold and each being oriented so that the fan-shaped jets extend at an acute angle to the axis of the manifold, and quick disconnect means on opposite ends of the manifold for alternately coupling a high pressure liquid supplying conduit to opposite sides of the manifold depending on the direction in which the fork lift is to travel along the runway.

3,709,437
METHOD AND DEVICE FOR PRODUCING FOAM
Hershel Earl Wright, Decatur, Ill.
Continuation of Ser. No. 761,688, Sept. 23, 1968, abandoned.
This application Sept. 14, 1970, Ser. No. 72,130
Int. Cl. B05b *11/00*
U.S. Cl. 239—343 **23 Claims**



A device for producing and dispensing foam including a deformable reservoir adapted to contain a quantity of foamable liquid and air, a discharge cap releasably secured to the reservoir and defining a discharge orifice in communicating relation with the interior of the reservoir, foam producing means supported within the reservoir in communicating relation with the foamable liquid, and a foam homogenizing overlay disposed for controlling the foam discharged. Selective air passage means are provided in a wall portion of the foam producing means defining a mixing chamber such that compression of the reservoir effects the introduction of foamable liquid and air into the mixing chamber wherein they are intermixed to produce foam which is thereafter discharged through the discharge orifice. Selected embodiments employ a ball check valve between the reservoir and the discharge orifice to maintain the liquid upwardly within the foam producing means, and air valve means to assist air return into the reservoir.

3,709,438
HAIR SPRAYING APPARATUS
Donald G. Johnson, 2015 Riverside Drive, Chattanooga, Tenn.
Filed Nov. 19, 1971, Ser. No. 200,406
Int. Cl. B05b *7/12*
U.S. Cl. 239—417.5 **5 Claims**



A spraying apparatus for use of operators in beauty shops is improved. The apparatus is the type having a spray material container in one part of the shop, and air and spray material lines leading from the container to guns at operators' stations. The problem of gun clogging is overcome by eliminating pinched off tubes within the gun.

3,709,439

PRODUCTION OF REFLECTIVE METAL FLAKE PIGMENTS

John Hayes Tundermann, Goshen, and John Herbert Harrington, Warwick, both of N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Dec. 2, 1970, Ser. No. 94,333
Int. Cl. B02c *15/00*
U.S. Cl. 241—15 9 Claims

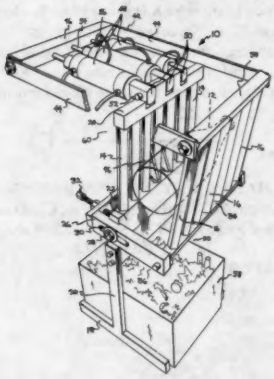
Directed to a metal flake powder of a stain-resistant metal or alloy and a process for producing the same wherein a metal powder of −100 mesh size is ball milled in a mobile liquid medium wherein the ratio of mobile liquid to powder being milled is at least about 10 to 1, e.g., about 25:1 to about 50:1.

3,709,440

HYDRAULIC POWERED BOTTLE CRUSHER

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 26, 1971, Ser. No. 109,778
Int. Cl. B02c *1/04, 25/00*
U.S. Cl. 241—36 5 Claims



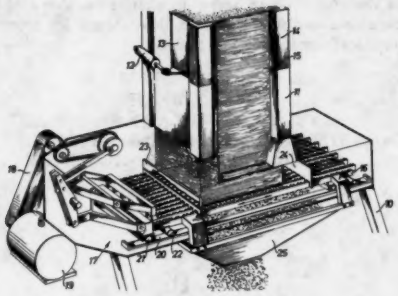
This invention provides a hydraulic powered bottle crusher which is adapted to crush bottles into small pieces for recycling. This device utilizes hydraulic pressure from a standard municipal or household water supply system to actuate a double-action piston which is controlled by means of a four-way valve. The double-action piston is connected to a plurality of movable crusher bars which cooperate with a plurality of fixed crusher bars to squeeze and crush a bottle therebetween. This device features a unique trigger and valve spool which are responsive to the presence of a bottle between the fixed and movable crusher bars to actuate the four-way valve and double-action piston to advance the movable crusher bars into compressing engagement with the bottle and to actuate the four-way valve and double-action piston to retract the movable crusher bars after the bottle has been crushed.

3,709,441

MACHINE FOR DISINTEGRATION OF CELLULOSE PULP SHEETS

Hans Hessner, Djursholm, and Per Olof Nilsson, Hallsberg, both of Sweden, assignors to Aktiebolaget Stille-Werner, Stockholm, Sweden

Filed Feb. 24, 1971, Ser. No. 118,460
Claims priority, application Sweden, Feb. 24, 1970, 2362/70
Int. Cl. B02c *1/12*
U.S. Cl. 241—94 8 Claims



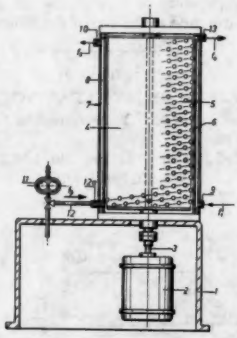
A machine for disintegration of cellulose pulp sheet which comprises an essentially vertical magazine to receive pulp sheet bales with the sheets preferably lying horizontally, said magazine having a bottom consisting of a bed of slightly spaced, mutually parallel tearing tooth rods which are longitudinally relatively movable to one another and may include two groups which are alternately movable in opposite directions.

3,709,442

MILL FOR THE REFINING OF COCOA, CHOCOLATE, PAINTS, LACQUERS, ENAMELS AND THE LIKE

Claudio Consoli, Milan, Italy, assignor to Carle & Montanari S.p.A., Milan, Italy

Filed Oct. 15, 1970, Ser. No. 81,072
Claims priority, application Italy, Oct. 18, 1969, 23544 A/69
Int. Cl. B02c *15/08*
U.S. Cl. 241—65 6 Claims



A mill for the refining of cocoa, chocolate, paints, lacquers, enamels and the like, which consists of a vertically extending stationary outer cylindrical casing, and a cylindrical rotor supported for revolvable movement concentrically within said casing. Partitions are provided on the outer wall of the rotor to form means supporting balls for rotation. The balls are thus positively guided whereby to exert a comminuting action by rolling alone. The balls as thus supported are arranged in a spiral path, defined by the partition means, extending along the outer wall of the rotor.

3,709,443

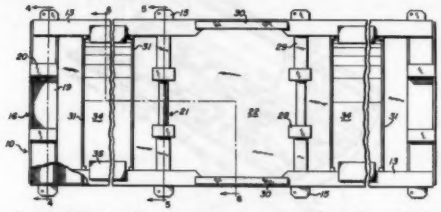
REFINER INSTALLATION

Donald P. Michel, Lake Oswego, Oreg.; Herman Steinige, Springfield, Ohio; Franklin F. Landis, Springfield, Ohio, and Lawrence Skeen, Springfield, Ohio, assignors to The Bauer Bros. Co., Springfield, Ohio

Division of Ser. No. 580,114, Sept. 16, 1966, Pat. No. 3,589,629. This application Feb. 8, 1971, Ser. No. 113,504

Int. Cl. B02c 7/11

U.S. Cl. 241—285 R 10 Claims



A simplified refiner base characterized by side walls formed by generally flat plates the upper and lower edges of which are bent inwardly to form upper and lower supports and the end walls of which include means for controlled air flow to and from said base.

3,709,444

POSITIVE THREAD FEEDER FOR CIRCULAR KNITTING MACHINES WITH A PLURALITY OF KNITTING POINTS

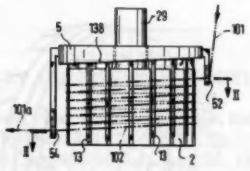
Karl Tannert, Birkenstrasse 1, Eggenfelden, Germany

Filed Aug. 19, 1970, Ser. No. 65,189

Claims priority, application Germany, Aug. 19, 1969, P 19 42 062.3

Int. Cl. B65h 51/02, 51/20

U.S. Cl. 242—47.04 9 Claims



A thread feeder for circular knitting machines having several knitting points, each comprising a rotary winding body. A storage coil is formed on each winding body by an axial feeding device, the storage coil embracing the winding body with several turns in a slip-free manner.

3,709,445

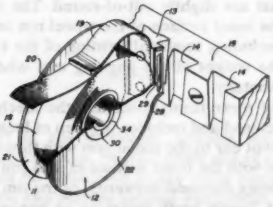
COILED MATERIAL DISPENSER

Jerry Adams, 1443 Homestead Road, La Grange, Ill.

Filed Oct. 2, 1970, Ser. No. 77,613

Int. Cl. B65h 19/00, 75/18

U.S. Cl. 242—55.2 12 Claims



A dispenser for coiled material stored in a roll and in which the dispenser is adapted for support by a holder. The dispenser comprises a support and a spool fixed to the support. The spool includes a pair of relatively movable sides joined together both by the support and by a hub which has a pair of separable hub sections capable of being locked together to carry the material roll between the sides. Either or both of the sides may be alternatively coupled to the support by an integral flexible plastic hinge or a wedge key and slot. The dispenser is loaded by disengaging the hub sections and separating the sides relative to one another without necessarily removing the dispenser from the holder. An optional dispensing control spring carrying a friction pad gently restrains the unwinding of the coiled material.

3,709,446

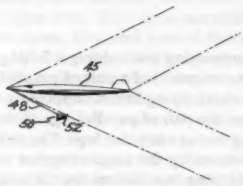
SONIC BOOM REDUCTION

Melvin P. Espy, Sunbelt Nursing Home, Route 1, P. O. Box 237, Sequim, Wash.

Continuation-in-part of Ser. No. 743,705, July 10, 1968, abandoned. This application May 9, 1969, Ser. No. 823,465

Int. Cl. B64c 23/04

U.S. Cl. 244—1 N 17 Claims



A method of reducing the overpressure imposed on a surface over which a vehicle travels at supersonic speeds by generating an expansion wave of an intensity and at a position whereby the surface contacting portion of the vehicle's shock wave is blended with and reduced by portions of the expansion wave. Apparatus for practicing this method include expandable material filled projectiles which are propelled away from said vehicle and an expansion wave generator in the form of a funnel which is positioned remote from the vehicle body of the wider mouth of the funnel facing in the direction of vehicle travel. The funnel may be structurally attached to the vehicle, towed by the vehicle or self-powered to some extent. Remote controlled and homing type expansion wave generators are also disclosed.

3,709,447

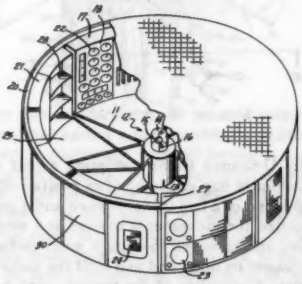
MODULAR SATELLITE

William A. Devlin, 1720 Canal Court, Merritt Island, Brevard County, Fla.

Filed July 29, 1970, Ser. No. 59,089

Int. Cl. F16d 63/00

U.S. Cl. 244—1 SS 6 Claims



A satellite apparatus is provided whereby a plurality of experiments may be monitored in a single satellite for a plurality

of different organizations. The satellite has modular casings for placement on a frame and adapted to place experimental components therein with instrumentation facing a centrally located scanner which transmits data on the experiments to a receiving station.

3,709,448

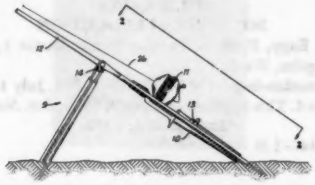
FISHING ROD HOLDER

Manuel Valverde, 419 East 10th Street, Seymour, Ind.

Filed April 6, 1970, Ser. No. 26,024

Int. Cl. A01k *97/10*

U.S. Cl. 248—46 **1 Claim**



A device for supporting and holding a fishing pole. The fishing rod holder is composed of a pair of parallel legs which are separated by an overlapping bar. A supporting bar is rotatably mounted between the pair of parallel legs. Rotatably mounted to the supporting bar are angular legs. The fishing rod is supported on the bottom by the supporting bar and held on the top by the overlapping bar. Spikes are formed in the ends of the legs to allow insertion of the legs into the ground.

3,709,449

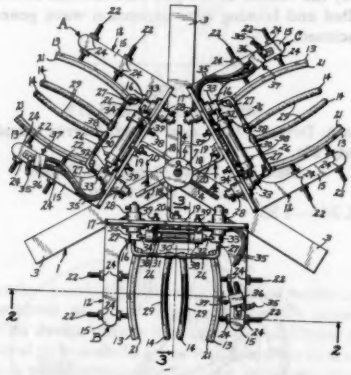
BAG HOLDING APPARATUS

William F. Martin, 8932 - 48th Avenue North, Minneapolis, Minn., and Esko E. Ranta, 4341 Browndale Avenue, Saint Louis Park, Minn.

Filed March 17, 1971, Ser. No. 125,225

Int. Cl. B65b *67/04*

U.S. Cl. 248—101 **7 Claims**



A generally U-shaped frame mounting a pair of opposed elongated stationary bag-engaging jaws positioned to receive the open upper end of a bag therebetween and a pair of movable jaws mounted for movements toward and away from the stationary jaws and arranged to engage inner surface portions of the bag adjacent its open end and hold the same against the stationary jaws. A plurality of the frames, each having independently operating holding jaws, is supported on a standard for rotation about a vertical axis, to position bags at different circumferentially spaced areas.

3,709,450

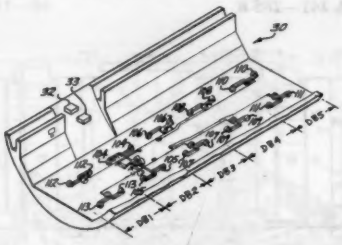
CARGO LOADING SYSTEM FOR AIRCRAFT

John F. Watts; John M. Lang; Alden D. Simonson, all of Bellevue, and Raymond S. Nomura, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 11, 1970, Ser. No. 97,201

Int. Cl. B64c *1/20*; B64d *9/00*

U.S. Cl. 244—118 **4 Claims**



The invention relates to an aircraft on-board, semiautomatic, baggage container and cargo pallet handling system utilizing a powered wheel drive system in combination with a cargo guide and restraint system for handling the weight of loaded full or half width sized contoured baggage containers and cargo pallets in loading and unloading operations for reducing aircraft turn around time.

3,709,451

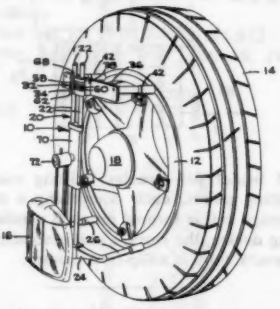
WHEEL MOUNTED TOOL SUPPORT MECHANISM

Edward P. Graham, Lansing, Mich., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 16, 1970, Ser. No. 89,672

Int. Cl. G01b *11/275*

U.S. Cl. 248—205 R **4 Claims**



Wheel mounted mechanism for supporting alignment equipment a substantial distance outwardly from the rim of a wheel on a radial support arm that is rigidly connected with a first pair of spaced rim engaging teeth and is pivotally connected to a crossbar that supports a second pair of rim engaging teeth which pivotally supported teeth compensate for wheel rims that are slightly out-of-round. The teeth in each pair engage the inner surface of the wheel rim and are widely spaced for precluding torsional twisting of the radial support arm due to the weight of the aligning tool when the arm is disposed horizontally.

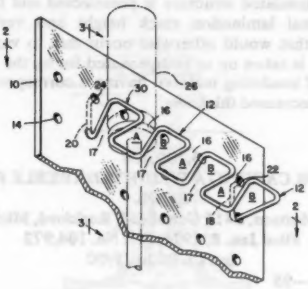
A method of more firmly mounting the mechanism to the rim is also disclosed and includes the step of locking the pivot point of the pivot bar to the radial arm with three of said teeth in engagement with the inner surface of said rim and with the fourth tooth being disposed outwardly of the rim, and the step of forcing the fourth tooth inwardly to engage and clamp against the inner surface of the rim and to place the mounting mechanism under stress.

3,709,452

APERTURE BOARD HANGER BRACKET

Clement J. Feeny, 228 East Meade Street, Philadelphia, Pa.

Filed Nov. 16, 1970, Ser. No. 89,870
Int. Cl. F16m 13/00
U.S. Cl. 248—223 2 Claims



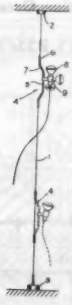
A aperture board hanger for bracket including a continuous bent wire attachment having a loop portion which includes a plurality of first open loops, all of which open in the direction facing the pegboard. The loop portion also includes a plurality of second open loops which alternate with the first loops and open in the direction facing away from the aperture board The loop portion terminates laterally in a pair of spaced spring arms which bend upwardly from the plane of the first and second loops and insert into respective spaced holes in the aperture board to detachably mount the hanger bracket on the aperture board. When the bracket is mounted on the aperture board, the terminal portions of the spring arms lock into other holes in the aperture board in a manner to secure the loop portion upon the front for implement hanging or removing purposes.

3,709,453

VERTICALLY AND CIRCULARLY DISPLACEABLE SUPPORT

Achille Castiglioni, Pizza Castello 27, Milan, Italy

Filed Nov. 4, 1970, Ser. No. 86,832
Claims priority, application Italy, Aug. 28, 1970, 5201 A/70
Int. Cl. F21v 21/34
U.S. Cl. 248—328 4 Claims



The support of the invention, suitable for illuminating devices, consists of a taut, vertical cable and of a slidable support which may be positioned at any point along the vertical axis of the cable and may be rotated thereabout. The force of gravity is overcome by frictional forces exerted by the support through the axial displacement of its central section.

3,709,454

BRACE ASSEMBLY

Richard E. Hyde, Palos Verdes Estates, Calif., assignor to Strolee of California

Filed Oct. 29, 1970, Ser. No. 85,143
Int. Cl. F16m 11/32
U.S. Cl. 248—351 9 Claims

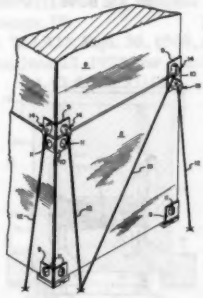
Described herein are collapsible brace assemblies which require a plurality of motions to revert from a bracing to a collapsed configuration. By reason of their construction, the brace assemblies of the invention can be safely and advantageously employed to support rails about collapsible enclosures, such as play pens. The brace assemblies comprise, in the most general sense, first and second brace bar members joined together by a linking member pivotally mounted in recesses formed in the joined ends of the brace bars. A sleeve, preferably of non-metallic material such as plastic, is coaxially and slidably positioned about one of the joined bars and can be slid into locking position about the joint at the joined ends of the brace bars to prevent pivotal motion of the connecting link therebetween. The sleeve is prevented from sliding past the joint by a stop, preferably constituted by an integral extension from the lower end of the linking member. Sidewise buckling of the brace is prevented by the sleeve and preferably also by the projection from and a lateral edge of the linking member.

3,709,455

TIE DOWN DEVICE

Walter A. Last, Islip, N.Y., assignor to Peck & Hale, Inc.

Filed Aug. 24, 1970, Ser. No. 66,493
Int. Cl. B61d 45/00
U.S. Cl. 248—361 A 5 Claims



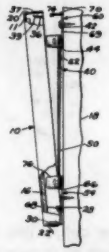
A tie down device adapted to be secured selectively to an anchorage member having a web provided with either a circular opening or an anchorage member having a web provided with an elongated opening. The tie down device has an opening of its own for receiving the end fitting of lashing means and is retained within the openings of the anchorage members by an integral elongated flange. Depending upon the thickness of the web of the anchorage member, a notch in the shank element of the tie down device may operate as an integral lock engaging the web thereby functioning as an integral lock further to prevent the tie down device from disengaging under load.

3,709,456

MOUNTING STRUCTURE FOR MIRRORS AND THE LIKE

Raymond L. Pietsch, Flint, Mich., assignor to The Engineered Products Company, Flint, Mich.

Filed Jan. 15, 1971, Ser. No. 106,771
Int. Cl. A47g 1/16
U.S. Cl. 248—475 15 Claims



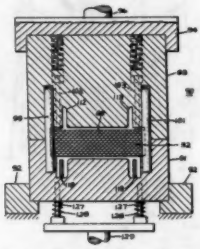
A structure for mounting a panel such as a mirror to a wall having a peripheral frame which receives the panel to be mounted from the rear or wall side thereof. The frame with the panel loosely retained therein is positioned to overlie a wall-mounted hanger structure and is pushed toward the wall to bring the frame into locking engagement with the hanger structure. Resilient bumpers on the hanger structure engage the rear panel surface to force the panel against the frame. The action of the bumpers with the panel also maintains a spring clip on the frame in locking engagement with a locking tab on the hanger structure to rigidly maintain the frame on the wall. Peripheral flanges on the frame extend rearwardly to the wall surface so as to conceal the attaching structure. A tool may be inserted through a small access hole in one of the flanges opposite the spring clip to bodily deflect the spring clip out of locking engagement with the locking tab so that the frame may be removed from the wall.

3,709,457

APPARATUS FOR FORMING AN INSULATING MEMBER IN SITU ON A LAMINATED MAGNETIC CORE

Ralph E. Church, Fort Wayne, Ind., assignor to General Electric Company, N.Y.

Filed Dec. 17, 1970, Ser. No. 99,049
Int. Cl. B29f 1/10
U.S. Cl. 249—91 7 Claims



Winding accommodating laminated structures having insulating member formed in situ thereon and method and apparatus for making same. Insulating member may include winding retaining elements that are useful while arranging one or more windings on the structure and for maintaining the winding in a desired position on the structure. Insulating member may be used to secure individual laminations together and may include winding termination holding and protecting means.

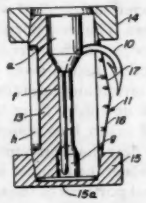
A preferred method includes forming an insulating member in situ on a stack of laminations which may be variable in height by placing the laminations in a mold cavity, closing a mold with a sufficient force to contain unhardened insulating material to be later admitted to the cavity and urging the laminations against an abutment in the cavit ywith a force less than the force used to close the mold. The apparatus includes mold parts that can accommodate laminations stacked to various heights and includes stack height accommodating means which may be spring biased pressure pins. The overall dimension of the insulated structure is preselected and fixed for a given nominal lamination stack height and variations in dimensions that would otherwise occur due to variations in stack height is taken up or compensated for by the formation of a layer of insulating material having a correspondingly increased or decreased thickness.

3,709,458

MOLD FOR CASTING A WEIGHTED TREBLE FISHING HOOK

Herbert L. Mattson, 3411 Gateshead, Rockford, Mich.

Filed Jan. 8, 1971, Ser. No. 104,972
Int. Cl. B22d 19/00
U.S. Cl. 249—95 4 Claims



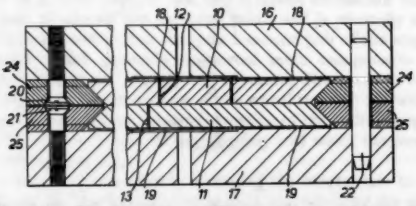
A casting mold having separable segments defining a cavity, the segments normally being held together by a slip-on holding member.

3,709,459

MOULD FOR CASTING ELECTRODE GRIDS FOR ELECTRIC STORAGE BATTERIES

Charles James Bushrod, Bramhall, England, assignor to Electric Power Storage Limited, Clifton Junction, Lancashire, England

Filed Nov. 19, 1970, Ser. No. 90,889
Claims priority, application Great Britain, Nov. 21, 1969, 57,066/69
Int. Cl. B22c 1/12
U.S. Cl. 249—134 8 Claims



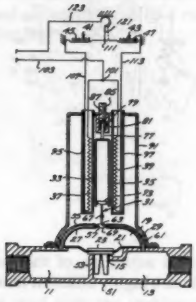
A mould for casting lead or lead alloy electrode grids for electric storage batteries comprises backing plates of metal faced with inserts of silicon nitride exposed to the melt.

3,709,460

VALVE CONTROL SYSTEM

Harold A. McIntoch, South Pasadena, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 805,138, March 7, 1969, Pat. No. 3,577,066. This application March 12, 1971, Ser. No. 123,733
Int. Cl. F03g 7/06; F16k 31/02
U.S. Cl. 251—11 11 Claims



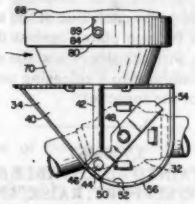
A valve control system including a valve body defining a flow control port having flow therethrough controlled by a poppet coupled with a pressure responsive member which forms one wall of a control chamber. Fluid flow through a bleed passage leading from the control chamber is controlled by a pilot valve which is itself controlled by an electric drive means. Current to the electric drive means is controlled by electrical resistance means which is formed with transverse portions disposed in heat exchange relationship with one another and flexible for movement toward and away from one another to adjust the rate of heat exchange between such portions to thereby adjust the mutual heating hereof and vary the overall resistance of such resistance means to control current to the electric drive means.

3,709,461

PLUG VALVE HAVING A DUAL DIAPHRAGM THREE POSITION ACTUATOR

Jesse R. Johnson, Gowanda, N.Y., assignor to AVM Corporation, Jamestown, N.Y.

Division of Ser. No. 723,862, April 24, 1968, Pat. No. 3,613,513.
Filed April 12, 1971, Ser. No. 132,958
Int. Cl. F16k 31/165; F01b 19/00
U.S. Cl. 251—58 10 Claims



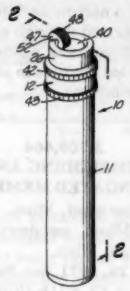
A combined plug valve and dual diaphragm three position actuator assembly wherein the actuator comprises a two part housing having two diaphragms clamped therebetween, the diaphragms being separated by a spacer ring and a fluid communication passage therethrough to a chamber formed by the diaphram. Two more chambers are defined by the outer surfaces of the diaphragm and the housing, and each chamber has a fluid communication passage thereinto. Springs in two of the chambers bias the diaphragms apart; one spring is located between the two diaphragms and includes a collapsible link unit to limit separation of the diaphragms. An operator rod extends through the housing from one of the diaphragms and is secured to a rotary operative lever on the plug valve. Thus assembled, the actuator operates the valve through three positions.

3,709,462

SLIT REGULATOR FOR GAS LIGHTER

Rodney S. Piffath, Northridge, and John J. Cole, Beverly Hills, both of Calif., assignors to Butana Match A.G., Zurich, Switzerland

Filed Dec. 28, 1970, Ser. No. 101,824
Int. Cl. F23d 15/02
U.S. Cl. 251—118 3 Claims



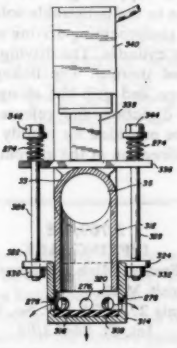
A gas lighter has a cartridge containing fuel under pressure, and containing a pressure reducing regulator comprising a disc of plastic material having a slit extending from the periphery to the center. The slit is formed by a sharp thin blade and no material is removed. The disc is accurately sized on diameter and is contained within an accurately sized bore provided in the cartridge. A separate metallic head assembly is provided with a screw having a tapered end. Turning movement of the head assembly relative to the cartridge drives the end of the screw into the cartridge to puncture a wall thereof. Fuel under pressure passes through the slit disc regulator and through the punctured opening and through passages to reach a flame port in the head assembly.

3,709,463

DRAIN VALVE

Andrew Geo. Griparis, Joliet, Ill., assignor to The Diversey Corporation, Chicago, Ill.

Division of Ser. No. 763,823, Sept. 30, 1968, abandoned. This application June 22, 1970, Ser. No. 59,827
Int. Cl. F16k 31/10
U.S. Cl. 251—129 2 Claims



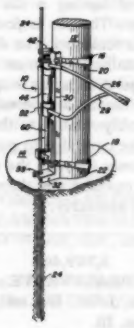
Apparatus for spray cleaning the soiled interior surfaces of a tank by alternately: (1) applying a burst of cleansing liquid through a sprayer which directs a heavy spray mist to saturate

the interior tank surfaces; and (2) enabling the applied cleansing liquid to soak for a timed interval on the tank surfaces. Portions of the apparatus can be used for cleaning pipelines associated with the tank. A tank sprayer which includes an equalization chamber for equalizing the flow of liquid around the spray head and a restricted outlet at one end of the equalization chamber to form a heavy spray mist in cleaning tank interiors. A quick drain valve for rapidly draining large amounts of liquid from a conduit including a solenoid actuated seal for selectively sealing or opening a series of drain openings around the perimeter of the valve. A liquid level indicating apparatus for indicating the drop in level below a preset level of liquid in any one of a number of closed containers each having a narrow neck for filling the container, including a detector inserted through each container neck for detecting the level changes, and a single air pressure sensor responsive to the detected changes in any of the containers for indicating a low level condition.

3,709,464
DEVICE FOR IMBEDDING AND REMOVING ELONGATED MEMBERS

Charles D. Johnson, Fairmont, Minn., and James T. Droege mueller, Welcome, Minn., assignors to Fairmont Railway Motors, Inc., Fairmont, Minn.

Filed Jan. 26, 1971, Ser. No. 109,838
Int. Cl. E21b *19/00*
U.S. Cl. 254—29 R 2 Claims



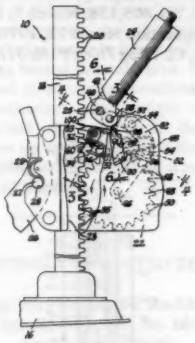
This device for driving or forcing elongated members such as electrical ground rods into a penetrable solid such as the subsoil comprises a supporting frame which is releasably anchored in relation to the penetrable solid, the frame having mounted thereon a reciprocating driving means such as a double-acting hydraulic cylinder. The driving means reciprocates gripping jaws linked thereto. The linkage is such that the gripping jaws engage and grip the elongated member upon movement in one direction and release it in the opposite direction. Means are provided for readily adapting the device for reversal of the direction of the gripping and release movements.

3,709,465
LIFTING JACK

Victor D. Valade, Fraser, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 27, 1971, Ser. No. 166,546
Int. Cl. B66f *3/02*
U.S. Cl. 254—95 7 Claims

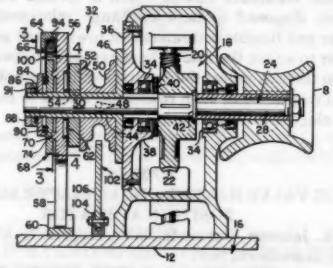
The lifting jack described herein incorporates a handle, a rack bar, a holding pawl for engaging the rack bar, coordinated linkage members, a wheel pawl and a toothed wheel functioning between the handle and the rack bar, a contoured spring interconnecting the pawls, and a manually-actuated selector lever for engaging or freeing the spring, the combination responding to the actuation of the handle to raise and lower an automobile in a highly efficient manner.



3,709,466
ANCHOR HOIST

Antone Dowrelio, Foot of Port Street, Crockett, Calif.

Filed Feb. 8, 1971, Ser. No. 113,187
Int. Cl. B66d *1/00*
U.S. Cl. 254—187 2 Claims



A power hoist for anchor chains and the like in which the rotation of the chain sprocket can be independently controlled of a drive motor. A sleeve is secured to a free shaft end disposed exteriorly of the gear housing and mounts the sprocket, a friction plate on each side of the sprocket and face cams for biasing the friction plates against the sprocket. The friction plates rotate with the sleeve and the shaft and the face cams are normally biased into a releasing position to prevent accidental rotation of the sprocket.

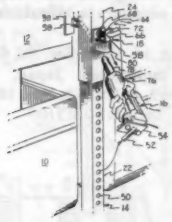
3,709,467
SELF CONTAINED ADJUSTABLE SUPPORT ASSEMBLIES TO SUPPORT, RAISE, AND LOWER A MOBILE LIVING FACILITY WITH RESPECT TO BOTH A VEHICLE AND THE GROUND

James F. Mann, 10507 East Harrison, Tacoma, Wash.

Filed Nov. 27, 1970, Ser. No. 93,295
Int. Cl. B66f *7/26*
U.S. Cl. 254—45 4 Claims

Mobile living facilities and other covered space structures are equipped with self contained adjustable support assemblies to support them above and lower them to ground, and to raise them above and lower them down on the receiving structure of a vehicle. Three self contained adjustable support assemblies are capable of supporting the mobile living facilities when secured to these facilities and resting on the ground.

Each support assembly has a supporting leg, an immediate leg surrounding guide sleeve secured to the mobile living facilities, and adjustable interlocks to secure supporting legs to the respective leg surrounding sleeves at selective variable effective leg lengths between the surrounding guide sleeve and the ground. Adjustments of the effective leg lengths are made by utilizing a self contained hydraulic jack that is removably positioned between each respective supporting leg and its corresponding surrounding guide sleeve. The jacking device is secured below to selective multiple receiving structures on the supporting leg and secured above to a receiving structure on the leg surrounding sleeve.



Before jacking, and with the jacking device in place, the respective adjustable interlock is withdrawn for the duration of the jacking movement. Subsequently, it is reset to thereafter transmit the lifting load independently of the jacking device. The travel of each raising or lowering motion corresponds to the travel of the removable jacking device.

One jacking device is moved about, during each overall height changing operation, to be used with the respective several support assemblies. Generally, four support assemblies are used and at least three are at all times secured by interlocks and are capable of fully supporting the mobile living facilities while the jacking unit is being used to adjust the height of the fourth support assembly.

3,709,468

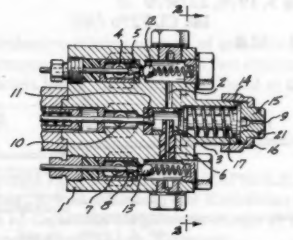
STATIC MIXING DISPENSER AND MIXING METHOD

Frank E. Ives, 1862 Ives Avenue, Kent, Wash.

Continuation-in-part of Ser. No. 696,190, Jan. 8, 1968. This application Feb. 10, 1971, Ser. No. 114,205

Int. Cl. B01f *15/02*

U.S. Cl. 259—4 **7 Claims**



In the course of flowing between a supply passage or passages, liquids are mixed by the bulk of the liquid following a helical path defined by a helical feather interrupted at intervals by notches or ports through which crosscurrents flow to intersect the main flow of liquid.

3,709,469

CARBURETOR

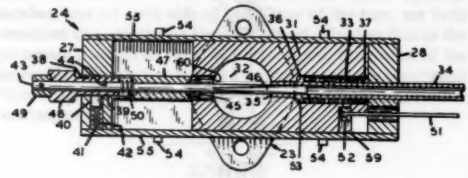
William H. Edmonston, P.O. Box 926, and Efton T. Carter, P.O. Box 78, both of Isabella, Calif.

Filed Feb. 2, 1970, Ser. No. 7,880

Int. Cl. F02m *9/06*

U.S. Cl. 261—44 R **2 Claims**

A carburetor improvement that can function in any mounted or turned position and have a positive shutoff of liquid fuel when a slide fuel tube is closed against a gasket on a needle. The needle is of uniform round material with a flat taper portion from the end thereof in the liquid fuel tube to near the gasket. The liquid fuel flows into the throttled air passage of the carberetor and increases as the tube is gradually withdrawn from the gasket to expose greater portions of the flat taper portion on the needle. The liquid fuel tube is mounted in a throttle slide valve plate to move therewith.



The needle flat taper portion is adjusted by being turned against the flow of throttled air for decreasing the supply of liquid; and adjusted by being turned with the flow of air to increase the flow of liquid at any instant sliding position.

A threaded knob bushing is provided for the needle to be turned therein and further adjust the flow of liquid fuel by longitudinal relative movement of the needle in the end portion of the tube.

3,709,470

FLOATING SURFACE AERATOR

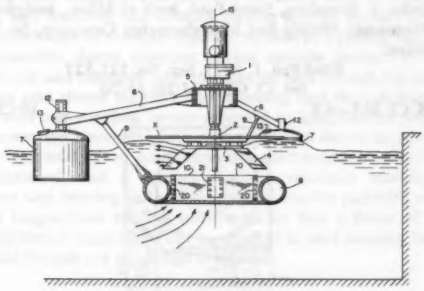
Herbert Auler, Michelbacher Hutte, and Josef Muskat, Michelbach, both of Germany, assignors to Passavant Werke, Hutte, Germany

Filed Oct. 23, 1969, Ser. No. 868,747

Claims priority, application Austria, Nov. 7, 1968, A 10814/68

Int. Cl. B01f *3/04*

U.S. Cl. 261—91 **9 Claims**



A floating surface aerating apparatus having most of its weight supported by a buoyant body, preferably annular in shape, immersed in liquid below the level of the surface flow created by the aerating apparatus, and including smaller stabilizing floats located on the surface radially outwardly of the aerating means. The buoyant body and the floats may be designed to facilitate liquid flow and a baffle arrangement may be provided in the vicinity of the buoyant body to influence upward flow of liquid to the aerating apparatus.

3,709,471

GAS WASHING BOTTLE

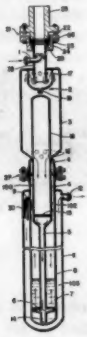
Robert Trefzer, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed July 22, 1969, Ser. No. 843,357

Claims priority, application Switzerland, July 25, 1968, 11215/68

Int. Cl. B01f *3/04*

U.S. Cl. 261—124 13 Claims



A gas washing bottle. The bottle has a lower vessel and an upper vessel having first and second portions, the first portion extending into the lower vessel to provide an enclosed first space between the first portion of the upper vessel and the lower vessel. A first pipe extends from the first portion of the upper vessel and terminates adjacent the base of the lower vessel. A first barrier vessel surrounds at least part of the lower vessel to provide an enclosed second space between the first barrier vessel and the part of said lower vessel. A first communication means provides communication between the lower vessel and the enclosed second space, this communication means being positioned on the lower vessel remote from the termination of the first pipe. The first barrier vessel has a first gas connection remote from the termination of the first pipe in said lower vessel. A second barrier vessel is provided and communication is provided between the second barrier vessel and the interior of the upper vessel. A second gas connection communicates with the second barrier vessel at a position remote from the first communication means.

3,709,472

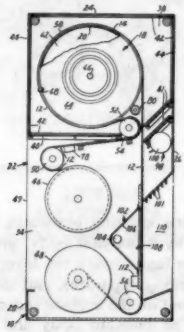
DEVELOPMENT DEVICE

Richard W. Kreitz, Eagan Township, Dakota County, and John A. Svendsen, Saint Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 1, 1971, Ser. No. 111,527

Int. Cl. G03g *13/20*, *15/20*

U.S. Cl. 263—6 E 19 Claims



A device for high speed development of a latent image on a strip of heat developable film moved by a drive means along a path in the device. The device includes a heated rotatable drum about which the film is tensioned and which affords conduction of a uniform predetermined quantity of heat to all areas of the film to effect even development thereof. The device includes means to thoroughly clean the surface of the film and of the drum prior to contact therebetween, and provides a cooling means to terminate development of the film after the film is separated from the drum.

3,709,473

HEATING APPARATUS

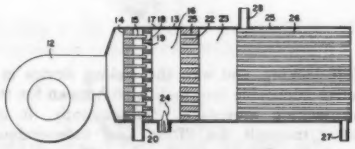
Toshio Ito; Tamotsu Nomaguchi, and Norikazu Tabata, all of Amagasaki, Japan, assignors to Mitsubishi Electric Corporation, Tokyo, Japan

Filed Aug. 14, 1970, Ser. No. 63,855

Claims priority, application Japan, Aug. 26, 1969, 44/67454; Sept. 4, 1969, 44/70164; Nov. 10, 1969, 44/89894

Int. Cl. F23l *1/00*

U.S. Cl. 263—19 R 11 Claims



Heating apparatus is provided for producing hot water or warm air which comprises an air blowing device, a compact combustion apparatus having a high load factor in which a combustion catalyst is employed, and a compact heat exchanger which is well-matched to the combustion apparatus, whereby high efficiency and high performance in the combustion and heat exchange processes are achieved.

3,709,474

ROTARY KILN FOR THE PRODUCTION OF A GRANULAR, BLOATED PRODUCT

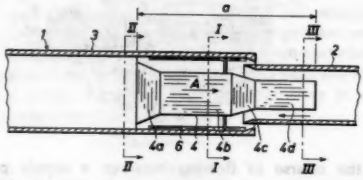
Harry Kamstrup-Larsen, Copenhagen Valby, Denmark, assignor to A/S Dansk Leca, Glostrup, Denmark

Filed Jan. 18, 1971, Ser. No. 106,994

Claims priority, application Denmark, Jan. 27, 1970, 373/70; May 5, 1970, 2279/70

Int. Cl. F27b *7/02*

U.S. Cl. 263—32 R 16 Claims



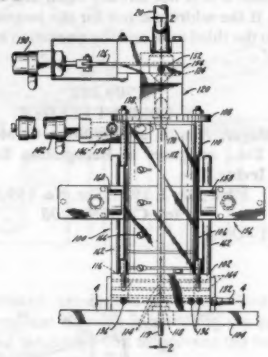
This invention relates to a rotary kiln for the production of a granular bloated clay product, the kiln comprising a drying-kiln section and a burning-kiln section. In the heating zone in which the temperature of the clay granules increases from 300°–400°C to 800°–900°C the kiln is provided with a centrally located gas-flow tube which serves to protect the granules from the oxygen in the flue gas in the heating zone so that the bloating will be very effective. When passing the heating zone the granules pass the annular cavity between the outer surface of the gas-flow tube and the inner surface of the kiln lining. The outer surface of the gas-flow tube is provided with blades extending along the tube so that improved heat transfer from tube to granules is obtained.

3,709,475

PREFOAMER

Daniel R. Gaul, Fort Worth, Tex., assignor to Crown Molding Co., Dallas, Tex.

Division of Ser. No. 856,914, Sept. 8, 1969, abandoned, which is a continuation of Ser. No. 509,973, Nov. 26, 1965, abandoned. This application Oct. 22, 1970, Ser. No. 83,247
Int. Cl. F27b 3/22
U.S. Cl. 263—21 B 11 Claims



This invention is concerned with an apparatus for prefoaming foamable plastic material by relating and controlling the volume and weight of the material so that a specific accurate density material will be produced.

3,709,476

MEANS FOR INDUCTIVE STIRRING

Per Erik G. Hammarlund, Hasselvagen 6, and Yngve S. Sundberg, Berghanravagen 10, both of Vasteras, Sweden

Continuation-in-part of Ser. No. 795,086, Jan. 29, 1969, abandoned. This application July 15, 1970, Ser. No. 54,899
Int. Cl. C21c 7/00
U.S. Cl. 266—34 A 2 Claims

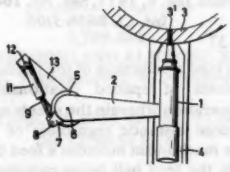
Means for inductive stirring of melt of metal or metal alloy in a ladle or furnace, comprising at least two electro-magnetic multiphase stirrers being oppositely positioned at the sides of said ladle.

3,709,477

MECHANISM FOR SWINGING A TAPHOLE GUN

Albrecht Baumer, Kreuztal-Eichen, and Karl-Heinz Schussler, Siegen, both of Germany, assignors to Dango & Dienenthal Kommanditgesellschaft, Dieger, Germany

Filed July 16, 1971, Ser. No. 163,275
Int. Cl. C21b 7/12
U.S. Cl. 266—42 13 Claims



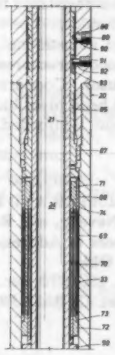
A taphole gun is mounted on a pivoted boom which is swung by means of a hydraulic ram arranged in such a way that the arc of swing is at least 180°. For this purpose a double-acting hydraulic ram is provided having a piston rod which acts on the pivoted boom at a point situated eccentrically with respect to the pivot axis of the boom and the ram has a hydraulic control device which reverses the direction of action of the ram during the swinging of the boom between a working position of the gun at one end of the arc of swing and a withdrawn position at the other end of the arc of swing when the ram passes through a dead-center position. The hydraulic control device preferably comprises a four-path three-position control valve and a switching device which, as the ram reaches its dead-center position, switches the control valve over into a position in which a forward and a return thrust cylinder chamber, one on each side of the piston of the ram, are both connected to a return line for the hydraulic fluid so that as the ram passes through its dead-center position, the piston of the ram is able to move freely in its cylinder so that the movement of the boom as the ram passes through its dead-center position is not impeded.

3,709,478

MECHANICAL JAR

James W. Kisling, III, 13719 Tosca, Houston, Tex.

Division of Ser. No. 82,284, Oct. 20, 1970. This application Dec. 23, 1971, Ser. No. 211,582
Int. Cl. F16f 1/02
U.S. Cl. 267—137 3 Claims



An illustrative embodiment in accordance with the present invention in jars includes a mandrel and housing which are telescopically disposed and adapted for connection in a pipe string, said mandrel and housing having spaced impact surfaces which can be brought together to deliver a jarring blow, an expansible sleeve member having threads meshed with threads on said mandrel, cam surfaces on said threads for expanding said sleeve member and releasing said threads from mesh with one another, means released by longitudinal relative movement between said housing and said sleeve member for locking said sleeve member in threaded engagement with said mandrel; and a resilient column structure coacting between said housing and said sleeve member for yieldably resisting longitudinal relative movement so that a force of a predetermined magnitude can be applied to said housing before said threads are permitted to release.

3,709,479

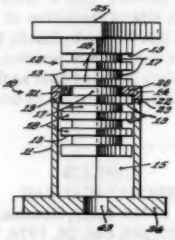
SETUP SUPPORT

James M. Dolphin, Route 3, Beloit, Wis.

Filed July 13, 1970, Ser. No. 54,215
Int. Cl. B23q 3/00
U.S. Cl. 269—309 9 Claims

A longitudinally rapidly adjustable setup support has a tubular member open at one end and an elongated member freely longitudinally adjustably telescopically assembled through and projecting from such end with at least one and desirably a

substantial series of axially inwardly facing peripheral shoulders thereon movable into and out of the tubular member in reciprocations of the members, with an axially outwardly facing shoulder device on such end of the tubular member adapted to be engaged selectively with the peripheral shoulders by a relative rotary movement of the device and the elongated member when the selected shoulder is located outwardly from such end. The tubular member may be of internally rectangular cross section and the elongated member of complementary rectangular perimeter with the shoulders



thereon formed by peripheral grooves, and the shoulder device is desirably a ring rotatably seated on the end of the tubular member and having a rectangular opening passing the elongated member when registered therewith and rotatable to engage the selected shoulder. The ring is constructed to be reversed for half stage adjustments. Great versatility in the head and base elements or structures of the device permit numerous and varied uses. Cooperation with supplemental devices, such as a ball head pivot block to obtain wide range angle support adjustment, is afforded.

3,709,480

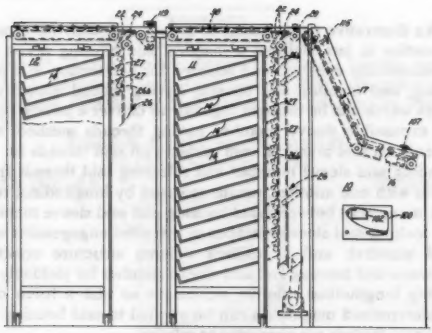
PAPER COLLATOR AND DISTRIBUTOR

Erwin F. C. Schulze, Novelty, and Robert G. Baker, Mentor, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Feb. 18, 1970, Ser. No. 12,225

Int. Cl. B65h *39/02*

U.S. Cl. 270—58 **24 Claims**



Sheet distributing mechanism in which sheets may be distributed under the control of punched tape to any selected catch tray in any one of a plurality of racks of catch trays with the mechanism being such that, after the selection of a tray, a counter may operate to direct a predetermined number of sheets to the tray without requiring the storing of additional sheet addresses on the tape. The operator may set a number in any one of a plurality of registers which can be selected by the tape to control the number of sheets to be delivered to a catch tray. When a sheet enters the sheet distributing mechanism, it causes the reading of an address from the tape and as it approaches the first rack of trays, it calls the address forward to a rack register. A decoder on the first rack directs the sheet into the rack if the address is for the rack by opening a rack gate if it is not already open and sets a tray gate within the rack to divert the sheet to the proper catch tray. If the address is not for the first rack, the sheet proceeds to the second rack and effects a transfer of its address to the second rack register. The operation of decoding the address is again performed at the second rack and if the address is for the second rack, a rack gate is opened if it is not already open and a tray gate in the rack is set. If the address is not for the second rack, the sheet proceeds to the third rack and the operation is repeated.

3,709,481

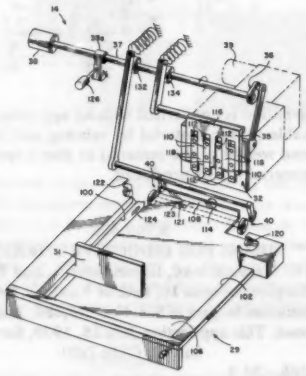
DOCUMENT FEEDER

Alton H. Meyer, Austin, and William C. Monday, Garland, both of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Filed July 2, 1971, Ser. No. 159,141

Int. Cl. B65h *3/08*

U.S. Cl. 271—30 A **24 Claims**



In a document feeder, documents are urged upwardly in a tray under the control of a photoelectric servo system. A shuttleplate having vacuum ports formed in it is mounted at the upper end of the tray, and a vacuum is maintained in the vacuum ports so that the uppermost document from the tray is engaged with the shuttleplate by vacuum attraction. Upon demand, the shuttleplate is reciprocated initially upwardly to clear the uppermost document from the tray over an upstanding lip. Then the shuttleplate is reciprocating downwardly to transport the document into engagement with sets of pinch rollers. As the document engages the pinch rollers, a document release member that normally overlies the shuttleplate is rocked outwardly to disengage the document from the shuttleplate.

3,709,482

HIGH SPEED DOCUMENT FEEDER

Carl R. Nelson, Kettering; Joseph F. Cattorini, Xenia, and Joseph J. Terbay, Dayton, all of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

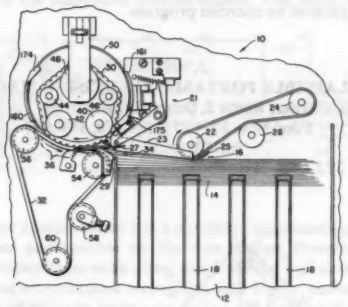
Filed Jan. 6, 1971, Ser. No. 104,295

Int. Cl. B65h *3/06*

U.S. Cl. 271—37 **15 Claims**

A document feed mechanism of the friction type for delivering single sheets in spaced relationship by means of synchronous operation wherein the sheets are spaced at a constant nose-to-nose distance regardless of the length of the document. The mechanism includes a feed belt and a retard or restraining belt, the feed belt being mounted on a feed wheel carrier which is adapted to be radially movable in relation to the axis of the feed wheel so that the periphery of the feed belt continuously coincides with the periphery of the feed wheel.

The feed belt is also continuously indexed by means of an eccentric and one-way clutch arrangement for the purpose of distributing feed belt wear over a larger surface. The feed mechanism includes means for stopping the flow of documents without stopping rotation of the feed wheel, wherein an



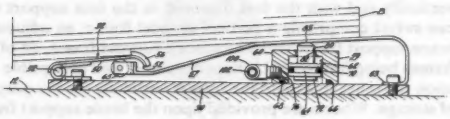
interposer, mounted concentric with the feed wheel and rotatable independent thereof, is placed in the path between the feed belt and the retard belt to prevent the feed belt from contacting the documents.

3,709,483

FEED SYSTEM FOR APPARATUS FOR PERFORMING OPERATIONS ON SHEET MATERIAL

Edward V. Henc, Promisedale Farm, Boot Road, R.D. No. 2, Malvern, Pa.

Filed June 30, 1971, Ser. No. 158,501
Int. Cl. B65h *3/24*
U.S. Cl. 271—44 R **6 Claims**



A feed bar assembly for apparatus for performing operations on sheet material including a feed station wherein a plurality of sheets are supported in a stack and means for reciprocating the feed bar to advance single sheets to a pair of feed rolls comprising an elongated bar and a plurality of feed fingers mounted along the length of said bar, each of said fingers including a plate member and a feed clip mounted on said plate member having a pickup portion adapted to engage an edge of one sheet at the bottom of the stack to advance the same to the feed rolls and actuator means adapted to pivot said feed fingers upwardly to insure positive engagement of each of said feed fingers with the edge of said one sheet, said actuator means including a leaf spring secured at one end to said feed bar and at its opposite free end engaging said plate member and a hydraulic actuator assembly engaging said leaf spring.

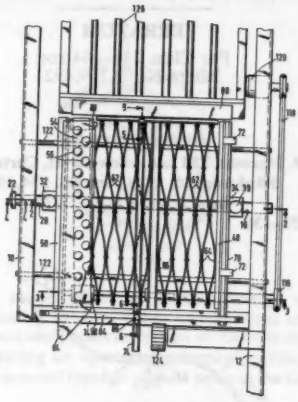
3,709,484

SHEET FEEDING AND ALIGNING TABLE

Hermann Kistner, Panoramaweg 4, Neckarweihingen, Germany

Filed Sept. 14, 1970, Ser. No. 72,049
Int. Cl. B65h *9/16*
U.S. Cl. 271—49 **6 Claims**

A table for feeding and aligning sheets of paper, cardboard or the like comprising a middle part and two lateral parts, the lateral parts being movable toward or away from the middle part. All three table parts are provided with upper and lower guides for a sheet. The lateral parts are adjustable independently from one another relative to the stationary middle part of the table for accommodating non-symmetric sheets. The adjustable table parts comprise spring bands arranged on edge



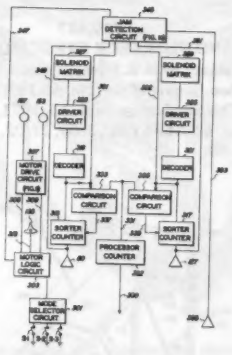
and interconnected at spaced points with one another, with the middle table part and with lateral guides. Means for adjusting the drive of an inclined conveyor belt to the various positions of one of the lateral guides.

3,709,485

CONTROL CIRCUIT FOR SORTING SYSTEM

Thomas J. Acquaviva, Jr., Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 24, 1971, Ser. No. 146,329
Int. Cl. B65h *7/00*
U.S. Cl. 271—57 **7 Claims**



A control circuit for a high speed copier sorting system having a plurality of sheet conveyors each having an associated motor drive for driving a predetermined one of the sheet conveyors for transporting sheets along a predetermined path past trays into which the sheets are distributed in accordance with a predetermined control logic. A jam detection circuit times signals received and is coupled to the motor drive to de-energize same in the event of a jam condition. A first circuit for supplying signals to the jam detection circuit indicative of the transit of sheets along the conveyor path. A second circuit for supplying signals to the jam detection circuit indicative of the transit of sheets leaving the conveyor path and entering a predetermined tray. A third circuit for counting reference signals representative of the number of copies produced by a copier. A fourth circuit for counting signals of the second circuit. A fifth circuit for comparing counts of the third circuit

and fourth circuit and supply a reset signal to the fourth circuit during normal sorting. In addition, the fourth circuit is coupled to the jam detection circuit to indicate a jam in the absence of a reset signal.

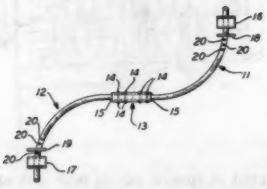
ERRATUM

For Class 271—64 see:
Patent No. 3,709,492

3,709,486
OFFSET SEESAW

Anthony A. Haroski, 134 Longellow Street, Carteret, N.J.

Filed Aug. 24, 1971, Ser. No. 174,490
Int. Cl. A63g *11/00, 1/32*
U.S. Cl. 272—30 15 Claims

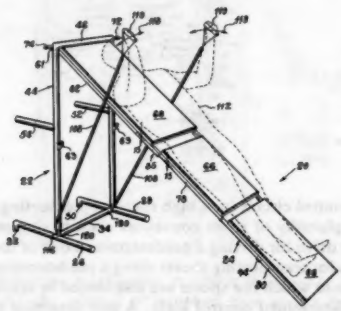


An offset seesaw comprising a pair of tortuous arms such as an elongated tube or bar and either unitary or separate, each lying in a flat plane rigidly connected together at a joining segment, the arms being mutually and dependently pivotable about an axis passing through the joining segment and preferably each of the arms having a 90° offset intermediate its ends, a seat is located on each of the arms, preferably positionally adjustably on the arms, the seats lying in a plane displaced from the said axis, the seats also lying on opposite sides of a plane perpendicular to the said axis generally at the center of the joining segment.

3,709,487
COMPACT AND STORABLE EXERCISING APPARATUS

Wendell R. Walker, 2026 E. Silver, Tucson, Ariz.

Continuation-in-part of Ser. No. 65,193, Aug. 24, 1970, abandoned. This application Sept. 13, 1971, Ser. No. 179,748
Int. Cl. A63b *1/00, 3/00, 21/02, 21/10*
U.S. Cl. 272—58 8 Claims

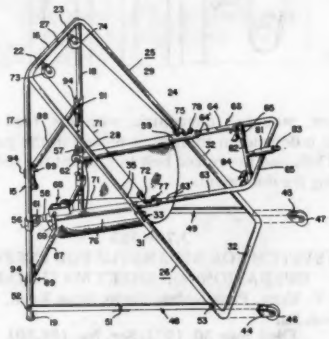


A compact and readily storable exercising apparatus. The apparatus in its folded form resembles a chair and may be so utilized. It comprises an upright stand member including a support base, a pair of tubular uprights, a U-frame adjustably telescoped on the uprights and a pair of arm pieces projecting from the legs of the U, and a three piece foldable board, one end of which may be engaged with pairs of supporting hooks on the stand with the remainder of the board arranged in accordance with the exercise program being undertaken. The board may be folded and supported by the arm pieces and uprights to yield the chair-like structure. With the board disengaged from the stand, the latter may be adjusted in height and utilized in chinning and lift-off exercises. A pair of tubular springs and hand pieces are stored in the hollow arm pieces and are attachable to points on the stand member for use in various parts of an exercise program.

3,709,488
COLLAPSIBLE PORTABLE EXERCISING MACHINE

Jimmy D. Garner, Route 2, Deatsville, Ala.

Filed Nov. 17, 1971, Ser. No. 199,597
Int. Cl. A63b *23/02*
U.S. Cl. 272—58 9 Claims



An exercising machine of the type to permit exercising while the body is extending horizontally with arms stretched vertically and with the feet disposed in the foot support that can swivel comprising a vertical support frame, an adjustable brace support frame and a hammock support frame, all of the frames being formed of U-shaped member and collapsible one upon the other to extend the frames vertically for the purpose of storage. Wheels are provided upon the brace support frame at the lower end thereof onto which the collapsed frames of the machine can be pivoted for the purpose of being transported. All of the frames are formed of U-shaped members with the brace frame comprising two U-shaped members with the legs of one U-shaped member telescoping with the legs of the other U-shaped member and held extended by latch pin devices but releasable to permit the collapse of the machine. The hammock frame assembly comprises a U-shaped member at the outer end having legs collapsible into sleeves which are pivotally connected to the legs of the vertical support and from which the hammock is supported. Handle bars are adjustably provided upon the vertical support frame and a winch can be used for vertically adjusting the hammock frame support to a vertically extended position when the machine is being adapted for storage. Either a T-shaved swivel foot support is provided upon the hammock frame assembly or a bicycle like pedal crank can be used for supporting the feet.

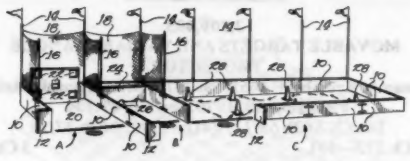
3,709,489
HOCKEY SKILL-TESTING, PRACTICE AND GAME APPARATUS

Thomas M. Holleran, 16932 School Street, South Holland, Ill., and Frederick T. Green, 1804 Camellia, Munster, Ind.

Filed July 6, 1971, Ser. No. 159,872
Int. Cl. A63b *69/00*
U.S. Cl. 273—1 B 15 Claims

This easily-assembled, low cost, versatile apparatus for evaluating the hockey skills of individual players, particularly their shooting, passing and stick handling abilities, comprises a self-supporting, multi-sectioned upstanding wall structure defining, on a substantially flat surface, at least first, second

and third adjacent substantially-rectilinear compartments. Two of the compartments have puck target means at one end and are open at the other end so as to provide a shooting position for the contestant, the puck target means comprising a vertically-disposed wall having a plurality of puck receiving apertures therethrough, the size and location of the apertures differing in the respective compartments. The third, substantially-larger compartment has a plurality of upstanding separator devices positionable on the flat surface therein and in spaced relation from each other and from the wall structure so as to define a continuous serpentine path for the contestant to follow. In addition to testing ice, roller and field hockey skills, the apparatus may be used for hockey practice and as a competitive game.



3,709,490

PLAY, SPORTS AND TRAINING APPARATUS

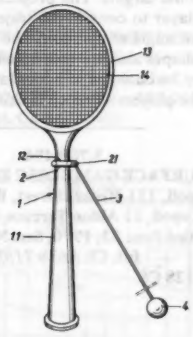
Gunther Manfred Wolfgang Pruss, Herzogstandweg 37, 8113 Kochel am See, Germany

Filed June 16, 1970, Ser. No. 46,753

Claims priority, application Germany, June 16, 1969, G 69 23 992.5

Int. Cl. A63b *69/38*

U.S. Cl. 273—29 A **4 Claims**



A highly elastic elongated connecting element is connected between two members, one of which is designed or provided with means adapted to accelerate the other member away from said one member. At least one of said members is resilient and capable of developing restoring forces and preferably capable of elastically yielding at least adjacent to a surface which is adapted to contact the other member. The connecting element is connected to the accelerating member by a swivel bearing.

3,709,491

TETHER BALL HOLDER

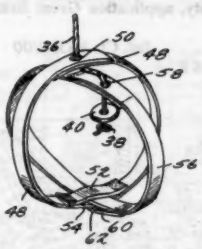
Kenneth R. Minchin, 1118 W. Coronado Road, Phoenix, Ariz.

Continuation-in-part of Ser. No. 144,984, May 19, 1971. This application Dec. 7, 1971, Ser. No. 205,504

Int. Cl. A63b *43/02*

U.S. Cl. 273—58 C **4 Claims**

A tether ball holder or harness for anchoring a tether to a ball. Straps are provided which are tightly fitted around surface portions of the ball, and an elongated tethering cord is passed through holes within the straps and is provided with a knot or other enlarged portion at one end of the tethering cord for cooperation with a perforated washer whereby the ball is tightly held by the harness. In one embodiment, each strap is endless and includes an interlocking strip which, in conjunction with the strap, defines an opening through which the other strap slidably extends. Other embodiments involve the use of straps including holes and loops at the ends thereof and a ring plate having an apertured tethering portion which is adapted to be inserted through aligned holes in the straps.



3,709,492

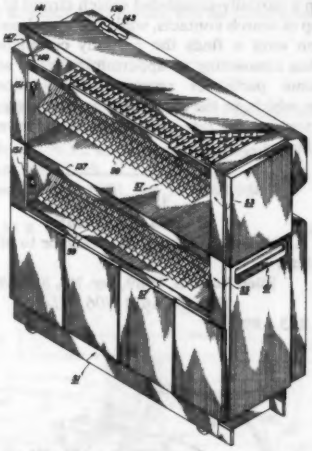
SORTING APPARATUS

Arthur R. Baker, Pittsford; William Brant, Rochester, and Clarence J. Danielson, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 24, 1971, Ser. No. 146,330

Int. Cl. B65h *29/58*

U.S. Cl. 271—64 **8 Claims**



Apparatus for receiving and distributing sheets in substantially vertically extending trays including first and second modular assemblies positioned in overlying relationship. Each modular assembly includes a frame supporting a wire framework forming vertically extending trays and a horizontal sheet conveyor in the form of endless belts extending in a path along the inlet side of the trays. At the inlet side of each of the trays is a movable sheet deflection gate which is pivotally supported and solenoid actuated in response to a control signal to route sheet material carried by the horizontal conveyor downwardly into a selected one of the trays. A separate drive is associated with each of the horizontal conveyors and a double acting clutch mechanism is associated with conveyors so that each of the modular assemblies may be operative to drive pinch rolls at the inlet of the sorting apparatus in the event that a drive becomes inoperative. The horizontal conveyors are supported in a pivotable cover to facilitate the clearance of paper jams along the sheet path.

3,709,493

RACE GAME AND CHANCE PROGRAMMING APPARATUS THEREFOR

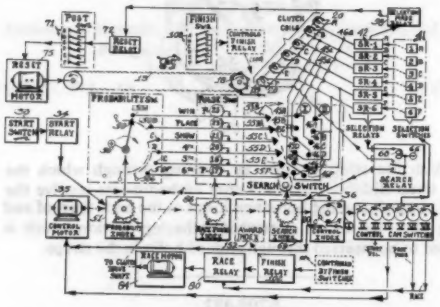
Joseph Edward Lally, McHenry, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Filed Jan. 28, 1971, Ser. No. 110,563

Claims priority, application Great Britain, Sept. 29, 1970, 46,322/70

Int. Cl. A63f 9/00

U.S. Cl. 273—86 F **7 Claims**



Chance operating permutation and combination switch apparatus of general use and as applied to a miniature, coin-controlled racing game. Motor-driven rotary probability and search switches are set in motion at the beginning of each operating cycle. A multiple-choice selection switch when operated stops the probability switch in some chance position to set up a partially-completed search circuit to some particular group of search contacts, while the search switch continues operation until it finds the partially completed circuit and stops, thus connecting an appertaining set of search contacts with some particular program combination of pulsing switches, which, in the illustrative horse-racing game application, determine the rate of advance of the several racing objects or horses.

3,709,494

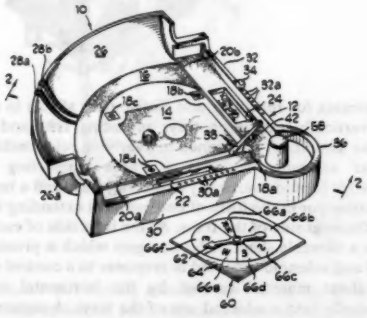
BASEBALL GAME

Gordon A. Barlow, Evanston, Ill., assignor to Marvin Glass & Associates

Filed Nov. 28, 1969, Ser. No. 880,698

Int. Cl. A63f 7/06, 7/14

U.S. Cl. 273—89 **2 Claims**



A game device simulating the game of baseball incorporating a playing surface simulating a baseball field, a swingable bat mounted at a homeplate position and a spinner type chance device. The game is characterized by the provision of an upwardly and outwardly curved outfield wall including a pitching guide down which a ball is rolled toward the batter. The curved outfield wall terminates in transverse wall surfaces comprising a continuation of the simulated foul lines of the simulated baseball field. If the ball is struck by the bat, it may be launched by the curved wall into a path of flight, and if not caught by the pitcher, will constitute a successful play for the batter, the type of advance to be determined from the spinner device.

3,709,495

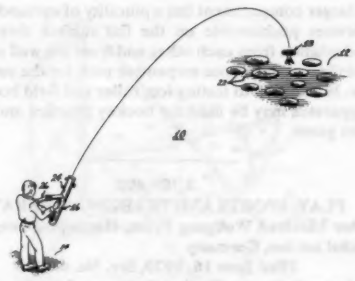
MOVABLE TARGETS AND VARIABLE ANGLE PROJECTOR

Norman A. Krombein, 14618 No. 37th Drive, Phoenix, Ariz.

Filed June 19, 1970, Ser. No. 47,734

Int. Cl. A63b 65/12; F41b 15/00; A63h 27/12

U.S. Cl. 273—101 **3 Claims**



A game is disclosed which utilizes a projector device, projectiles and a variably configured target area containing a plurality of individual targets. The projector device is capable of enabling the player to control the trajectory of projectiles by controlling their angle of ejection. The targets may be of various sizes and shapes and are individually movable so that the target area may be changed in accordance with a lesson to be learned or as the players advance in skill.

3,709,496

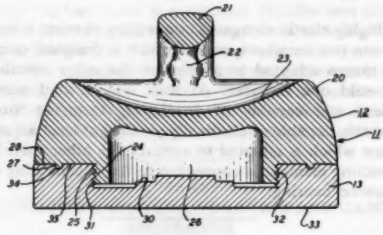
SURFACE GAME DISC ELEMENT

Carmen DeCepoli, 111 Heckel Street, Belleville, N.J., and Edward C. DeCepoli, 11 Aldon Terrace, Bloomfield, N.J.

Filed June 23, 1970, Ser. No. 49,115

Int. Cl. A63b 71/00

U.S. Cl. 273—128 CS **4 Claims**

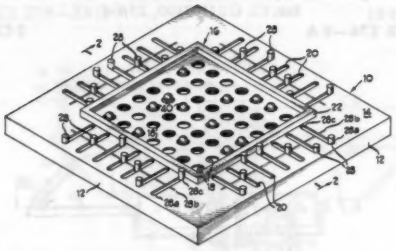


A surface game disc element, for use as a piece in the play of a disc game on a relatively smooth surface, having novel structural features to facilitate the self-returning of the disc element to an upright, play position and reducing the tendency thereof to flip onto an obverse side, to bounce, or to otherwise move in a skew manner, and to further facilitate the interchange of parts thereof after use and wear to enable continued used of the element.

3,709,497
MARBLE TYPE BOARD GAME APPARATUS

Gordon A. Barlow, Skokie, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed March 25, 1971, Ser. No. 127,871
Int. Cl. A63f 3/00
U.S. Cl. 273—130 R 2 Claims

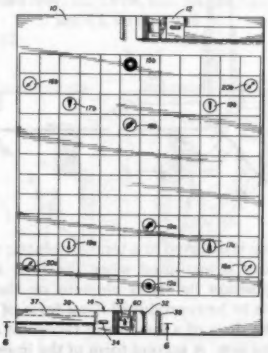


A marble game including a playing board having a plurality of parallel rows of openings through the board, and including a plurality of sets of different colored marbles. Underlying the playing board are two sets of elongated strips, each strip having a plurality of variably spaced-apart openings therethrough and being movable along the path of one of the rows of openings in the playing board. The two sets of strips are disposed at right angles with respect to each other. The players' marbles are placed at random in the openings in the playing board surface, and the players take turns manipulating the movable strips in an effort to align openings in the strips with openings in the playing board, so as to cause an opponent's marble to drop through the aligned openings.

3,709,498
BOARD GAME APPARATUS COMPRISING PLAY PROGRAMMING MEANS

Paul Liston, 36 Inverness Road, Norwood, Mass.

Filed Sept. 13, 1971, Ser. No. 179,769
Int. Cl. A63f 3/00
U.S. Cl. 273—131 AB 5 Claims

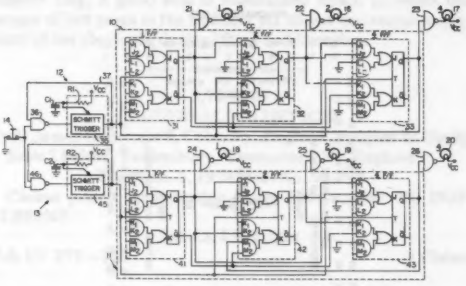


Game apparatus comprising a game board divided into a plurality of stations with some stations coded for playing pieces and equivalent coded stations on each side for opposed players, a plurality of different playing pieces on each side corresponding to coded stations, a planner on each side including a plurality of cubes having each side coded to indicate a particular action for a particular playing piece and a housing for holding a plurality of cubes for displaying one face of one cube at a time and arranged so that a player may produce an advancement of the plurality of cubes in the planner following one previously displayed to sequentially indicate moves of corresponding playing pieces on the game board.

3,709,499
ELECTRONIC AMUSEMENT DEVICE

Samuel C. Lukens, Jr., Needham, Mass., assignor to Electronic Data Controls Corporation, Forsyth County, N.C.

Filed Dec. 24, 1970, Ser. No. 101,265
Int. Cl. A63f 5/00
U.S. Cl. 273—138 A 1 Claim

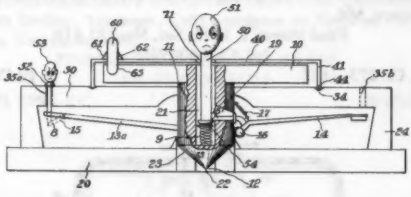


Electronic apparatus for simulating the throwing of a pair of dice including two counters each of which is operable to count continuously in sequence through six operating states. The counters are each caused to count by high frequency triggering pulses from respective pulse generators. The particular operating state of each counter is indicated on a suitable display. A single push-button switch is depressed momentarily to actuate the two pulse generators thus causing the counters to switch continuously through the six operating states. When the push-button switch is released, the counters stop and the operating states at which they remain can be determined from their respective displays.

3,709,500
CHANCE OPERATED PEG ELEMENT PROJECTING DEVICE

Arnold Coby, Bronx, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed July 26, 1971, Ser. No. 165,956
Int. Cl. A63b 71/00
U.S. Cl. 273—138 R 5 Claims



This invention is a game apparatus comprising a first rotatable horizontal disc, a second rotatable horizontal disc with both discs rotating about the same axis and means to rotate both discs either at the same rate or at different rates of angular velocity. A peg, the upper portions of which is shaped in the caricature of a head, is inserted into the vertical hole at the pivot of the rotatable discs, against a coiled compression spring and this peg is restrained by a hidden catch mechanism from being vertically ejected by the compression spring. A series of holes are located about the periphery of the top of the apparatus, and the several players, in turn, insert pegs into these holes after the discs have come to rest seeking to hit the hidden catch member. When the hidden catch member is touched by the peg of the successful player, the headed peg at the axis of the discs is ejected up into the air by the coiled compression spring.

3,709,501
METHOD OF DEALING PREDETERMINED HANDS

John B. Traylor, 3285 South Newport, Denver, Colo.

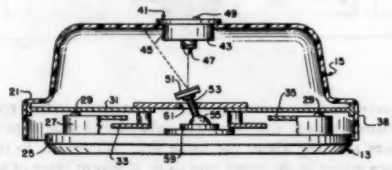
Filed Oct. 9, 1970, Ser. No. 79,540
Int. Cl. A63f *1/14*
U.S. Cl. 273—149 P 9 Claims

A method of dealing predetermined bridge hands is described in which the predetermined hands are obtained by performing an operational sequence of card rearrangements (S^{-1}, the inverse of S, defined below) on certain designation hand lists. These lists are obtained by performing a chosen set of operational sequences (S) on the predetermined hand by a non-player. The lists in no way give a clue to the players of the content of the predetermined hands to be dealt. Provisions are made for comparing the resulting score achieved, after play of the hand, with that which other partnerships were able to obtain. The overall method is a desirable aberration of duplicate bridge.

3,709,502
MESSAGE DEVICE

Dennis G. Wyman, Owings Mills, and William J. Bichell, Phoenix, both of Md., assignors to Granta Corporation, Baltimore, Md.

Filed March 1, 1971, Ser. No. 122,619
Int. Cl. A63f *9/18*
U.S. Cl. 273—161 10 Claims

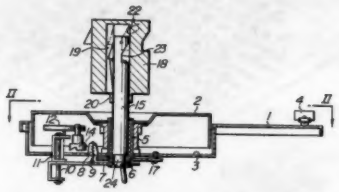


A message device for two or more participants comprising a base having a reflective member swiveled thereon. A domed cover overlays the base and reflective member and carries an electric light which shines on the reflective member. At least part of the domed cover is translucent and has indicia, e.g., letters, numbers, words, etc., printed thereon. The reflective member is moved in response to resultant forces applied by the participants and casts a reflected finger of light on selected ones of the indicia, thereby spelling out a "message."

3,709,503
SPEED CHANGING DEVICE OF AUTOMATIC RECORD PLAYERS

Kenzo Kamio, Shijonawate-shi, and Seizo Miyoshi, Hirakata-shi, both of Japan, assignors to Matsushita Electric Industrical Co., Ltd., Osaka, Japan

Filed Nov. 12, 1970, Ser. No. 88,864
Claims priority, application Japan, Nov. 21, 1969, 44/93758
Int. Cl. G11b *3/00, 25/04*
U.S. Cl. 274—9 A 2 Claims

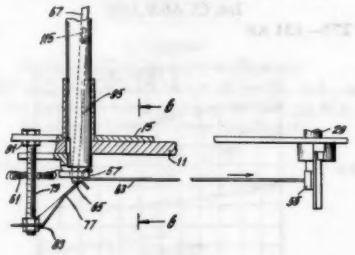


A speed changing device for use in an automatic record players wherein a plurality of disc records stacked on a spindle are dropped on a turntable and played one after another automatically and successively. An adapter for use with 45 r.p.m. records is mounted on the spindle, whereby the position of an idler pivotally connected to one end of the spindle is shifted and the speed of the turntable is changed from 33 1/3 r.p.m. to 45 r.p.m.

3,709,504
PHONOGRAPH APPARATUS

Henry A. Sherwood, Short Hills, N.J., assignor to Lorraine Industries, Inc., Bridgeport, Conn.

Filed Nov. 21, 1969, Ser. No. 878,799
Int. Cl. G11b *17/10*
U.S. Cl. 274—10 S 1 Claim



The invention is directed to a semi-automatic record player. The record feed is instituted when the tone arm is moved manually to position its stylus element on the edge of the record which is to be reproduced. One form of the invention provides for the drop of a lowermost record of a stack by actuating the tone arm. A second form of the invention initiates the record drop following a manual movement of the guiding and supporting spindle in a direction axially of the spindle toward the record supporting turntable prior to a positioning of the tone arm. Each form of the invention provides for holding a stack of records prior to reproduction in a position substantially parallel to the record turntable. Further, the components are so arranged that all may be carried within a completely portable carrying case in which they are adapted to be enclosed. The complete unit is self-contained and includes within the casing suitable sound reproducing apparatus, as well as all necessary amplifier components for energizing the sound reproducer in accordance with the record immediately being traced by the tone arm stylus.

3,709,505

SOUND REPRODUCING APPARATUS

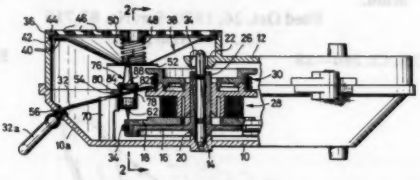
Anton Ashmele, Trossingen, Germany, assignor to Trossinger Metallstimmenfabrik Hans Eisen, Trossingen, Germany

Filed Feb. 4, 1970, Ser. No. 8,589

Claims priority, application Germany, Feb. 7, 1969, P 19 06 031.2

Int. Cl. G61b 3/10

U.S. Cl. 274—23 R 10 Claims



A toy phonograph wherein mechanical vibrations of the tone arm in response to tracking by its stylus of a sound groove in a rotating record are transmitted to the loudspeaker diaphragm by means of a two-armed follower which is pivotably mounted on the tone arm and has a shorter arm engaging a contact plate on the central portion of the diaphragm and a longer arm which is biased by a spring to maintain the shorter arm in engagement with the contact plate. The ratio of the pressure with which the stylus engages the record to the pressure between the shorter arm and the contact plate is about three to one and the ratio of the lengths of the two follower arms approximates the ratio of the force with which the stylus bears against the record to the average force with which the spring acts on the longer arm. The point of engagement between the shorter arm and the contact plate of the diaphragm is in line with the axis of the stylus.

3,709,506

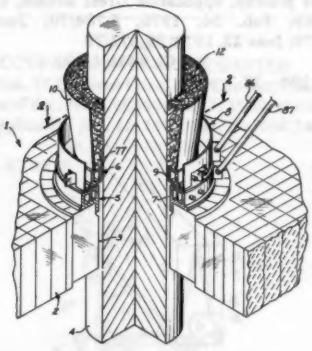
FURNACE ELECTRODE SEAL

Ludovicus Johannes Beerman, Tracy, Quebec, Canada, assignor to Quebec Iron and Titanium Corporation, Sorel, Quebec, Canada

Filed Nov. 12, 1970, Ser. No. 88,550

Int. Cl. F16j 15/56

U.S. Cl. 277—12 18 Claims



An electric furnace seal including a first water cooled seal ring mounted on the furnace adjacent the electrode opening. A support ring is on the seal ring and the support ring is supported independently of the seal ring, yet engages a seal surface of the ring. A second seal ring is seated on the support ring and is constrained for transverse movement only and against upward movement relative to the support ring. The opening through the lower seal ring and the support ring is somewhat greater than the diameter of the electrode, whereas the opening through the second seal ring is of a diameter approximating that of the electrode. A frusto-conical packing retaining hat extends upwardly from the second seal ring and provides for packing the upper end of the slight clearance space between this seal ring and the electrode. By virtue of this arrangement where the second seal ring "floats" on the support ring, a good seal is maintained which prevents the escape of hot gases at the opening yet allows transverse movement of the electrode during lifting and lowering.

3,709,507

FLUID SEALING DEVICES

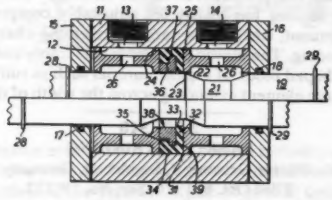
Cyril James Underwood, Coberley, England, assignor to Dowty Seals Limited, Tewkesbury, Gloucestershire, England

Filed Dec. 3, 1970, Ser. No. 94,792

Claims priority, application Great Britain, Dec. 18, 1969, 61,852/69

Int. Cl. F16k 3/24

U.S. Cl. 277—188 3 Claims



A sealing device suitable for use in a control valve which has a slidable valve member with a greater diameter portion engageable within the sealing device to close a valve passage, wherein the sealing device includes a resilient sealing ring and a supporting ring which interlock. The sealing ring has a radially-extending portion providing an inner sealing face which is engageable by the valve member, and an axially-extending portion which is engageable within the body of the control valve. The supporting ring is disposed radially within the axially-extending portion and on one side of the radially-extending portion.

3,709,508

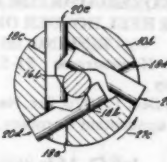
CHUCK ASSEMBLY WITH CENTRIFUGAL COLLET

Francis Dudley, Torrance, Calif., assignor to Excellon Industries, Torrance, Calif.

Filed Nov. 12, 1970, Ser. No. 88,610

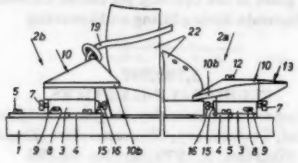
Int. Cl. B23b 31/14

U.S. Cl. 279—1 C 26 Claims



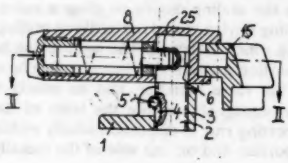
A cylindrical chuck has an axial bore for reception of a tool shank. A radially extending transverse chamber intersects the bore and contains a pair of collets. Each collet has a massive outer end and an inner wedge portion. The two wedge portions are oppositely disposed and each bears tangentially upon an oppositely disposed side of the tool shank. The collet pieces grip the tool shank and lock it to the chuck in response to a combination of centrifugal force, tool torsion and acceleration of the chuck. An arrangement of O-rings holds the several parts in assembled condition within the chuck and also retains the tool when the device is at rest.

3,709,509
RELEASABLE SKI BINDING
Kurt Hildebrand, Koetschachtal 33, Badgastein, Austria
Filed Oct. 6, 1970, Ser. No. 78,348
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T **11 Claims**



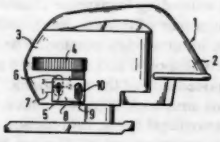
A safety ski binding for the toe and/or heel of the boot with a housing mounted on the ski and a movable unit consisting of a generally horizontal holding jaw with a generally vertical portion that reacts against an elastic element within the housing. The binding has means for adjustably compressing the elastic element, whereby to vary the releasing characteristics of the binding. The elastic element is preferably composed of a prism-shaped block of elastic material such as rubber or soft plastic, such element extending across the width of the ski.

3,709,510
SAFETY SKI BINDING
Hans Gotz, Oberer Grasweg 8, Ingolstadt, Germany
Filed Oct. 8, 1970, Ser. No. 79,222
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T **39 Claims**



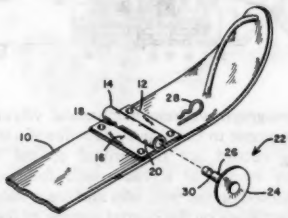
A safety ski binding primarily for holding the toe portion of the sole of a ski boot. It is the principal feature of this binding that its sole holder is adapted to be shifted laterally by the boot from its normal control position for a considerably greater distance before it is released and thereby releases the boot than the sole holders of ski bindings of this general type which were designed prior to the invention.

3,709,511
DEVICE FOR ADJUSTING THE RETAINING FORCE WHICH IS TO BE OVERCOME FOR A SAFETY RELEASE OF A TOE OR HEEL HOLDER OF A SAFETY SKI BINDING
Hannes Marker, Hauptstrasse 51-53, Garmisch-Partenkirchen, Germany
Filed Dec. 1, 1970, Ser. No. 93,943
Claims priority, application Germany, Dec. 9, 1969, P 19 63 796.8
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T **5 Claims**



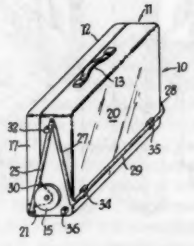
The safety release is effected by the disengagement of coupling means having a member which is under the action of the retaining force. At least one adjusting member is provided for effecting a standard adjustment and a differentiating adjustment. A locking member is provided, which is adjustable or releasable only by means of a tool and normally permits only of the differentiating adjustment.

3,709,512
SNOWMOBILE STABILIZING DEVICE
Robert V. Albertson, 2100 Shady Wood Road, Minneapolis, Minn.
Filed Oct. 26, 1970, Ser. No. 83,716
Int. Cl. B62m 27/00
U.S. Cl. 280—28 **5 Claims**



A stabilizer device adapted to be removably mounted on the skis of a snowmobile type vehicle for providing stability on ice or hard packed snow is described. The stabilizer comprises a steel wheel mounted for rotation on one end of an axle, the other end of the axle adapted to be inserted into a tubular bracket mounted at the ski. A cotter pin or other similar device holds the axle in the bracket in normal use, but permits the wheel assembly to be removed completely or replaced on the other edge of the ski.

3,709,513
TROLLEY CASE
Khalil Ahmad Ibrahim Cassimally, Climax, Saskatchewan, Canada
Filed Dec. 21, 1970, Ser. No. 100,033
Claims priority, application Great Britain, Dec. 24, 1969, 62,764/69; Feb. 24, 1970, 8,784/70; June 12, 1970, 23,541/70; June 22, 1970, 30,072/70
Int. Cl. B62b 1/00
U.S. Cl. 280—37 **7 Claims**



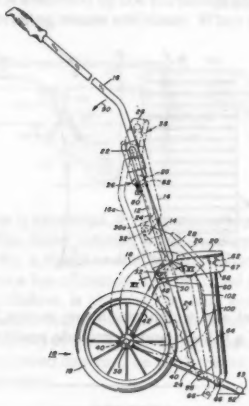
A collapsible trolley which in its collapsed condition can be used as a portable case and more particularly to a trolley of the type in which the wheels and a handle framework can be folded into a position in which they are compactly contained adjacent the sides of the case or into a position in which the case and the wheeled handle framework form a trolley adapted to receive and support additional cases or luggage.

3,709,514

FOLDABLE GOLF CART

Thomas S. Kaczmarek, 203 Bernice Street, Pittsburgh, Pa.

Filed Aug. 12, 1971, Ser. No. 171,208
Int. Cl. B62b 1/12, 1/26
U.S. Cl. 280—41 C 8 Claims



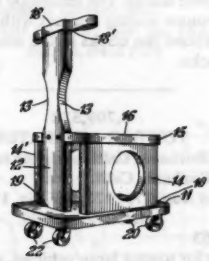
A golf cart of the collapsible or foldable type embodying a handle for pulling the cart when in use; and which handle is operable as a lever in conjunction with a pair of inverted U-shaped frames having top transverse members and vertical side portions to which the transverse members spaced portions of the handle are pivotally mounted, so that in the upright or use position of the handle the wheels on which the cart are mounted are in a lowermost position. In the lowered or non-use position of the handle, the wheels are raised by one of the frame members to a collapsed or non-use position of the cart; there being a fabric bag having transversely spaced vertical pocket means for receiving golf clubs depending from the upper end of the bag and extending between the wheels; there being a foldable seat member adapted for use on the side of the frame opposite that of the wheels which seat member is likewise foldable into a collapsed position against the frame, and there being manually operated latch means associated with the handle and the transverse members for retaining the handle in the upright position.

3,709,515

OCCUPANT PROPELLED COASTER

Robert Kilcullen, 75 Osborne Lane, New Canaan, Conn.

Continuation of Ser. No. 839,405, July 7, 1969, abandoned.
This application Jan. 13, 1971, Ser. No. 106,246
Int. Cl. B62b 11/00
U.S. Cl. 280—87.02 W 6 Claims



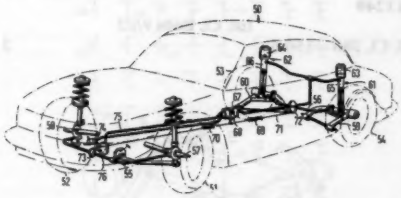
Occupant propelled coaster having a wheeled base and a seat and handle rigidly attached thereto. The rear portion of the seat is set in from the rear of the base and the handle is adapted to serve as a back rest and the portion of the base extending beyond the seat is adapted to serve as a foot rest for a child seated backwards on the coaster. A semi-enclosed storage space between the base and seat is also provided.

3,709,516

MOTOR VEHICLE SUSPENSION SYSTEMS

Bruno Ewert, Russelsheim, Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 2, 1971, Ser. No. 168,184
Claims priority, application Germany, Aug. 13, 1970, P 20 40 236.2
Int. Cl. B62d 7/06
U.S. Cl. 280—96.2 R 6 Claims



A suspension system for a motor vehicle includes a cranked axle which has at its central region a universal connection to a sprung portion of the vehicle. A pair of pivotal control arms prevent movement of the cranked axle about a vertical axis. A pair of wheel carriers are articulated to respective offset end portions of the cranked axle about hinge axes which converge forwardly to a point rearwardly of the universal connection for the cranked axle. A pair of telescopic shock absorbers, or other pivotal guide members, possibly associated with suspension springs, extend between the respective wheel carriers and the sprung portion of the vehicle. Wheel spindles forming rotary mountings for the road wheels are fixedly, or in the case of a front suspension pivotally, mounted on the wheel carriers.

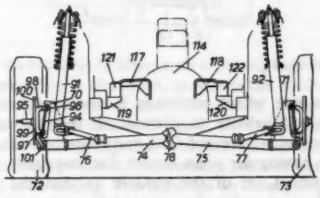
The cranked axle comprises a pair of offset arm portions which may be interconnected either rigidly or, especially for a front suspension, hingedly about a substantially vertical hinge axis.

3,709,517

APPARATUS FOR LEVELLING A VEHICLE CHASSIS

Felix Wossner, 872 Schweinfurt am Main, Germany, assignor to Fichrel & Sachs AG, Schweinfurt am Main, Germany

Filed May 17, 1971, Ser. No. 143,929
Claims priority, application Germany, May 21, 1970, P 20 24 750.1
Int. Cl. B60g 21/04
U.S. Cl. 280—104 12 Claims



A sensing element in a chassis levelling arrangement for an automotive vehicle is connected to an axle of the vehicle and to the vehicle chassis directly or indirectly by respective tension springs which bias the sensing element in opposite

directions. As the axle moves relative to the chassis, the sensing element makes a corresponding movement greatly reduced in magnitude. Movement of the sensing element is transmitted to a control mechanism for adjusting the spacing between the axle and the chassis in a direction to counteract the initial axle movement.

3,709,518

METHOD AND DEVICE FOR MANEUVERING THE STABILIZING STAYS OF A MECHANICAL EARTH-WORKING VEHICLE

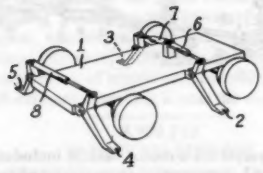
Yves M. Gauchet, Senlis, France, assignor to Societe Anonyme Poclain Le Plessis-Belleville, Oise, France

Filed April 10, 1970, Ser. No. 27,384

Claims priority, application France, April 11, 1969, 6911249

Int. Cl. B60s *9/02*

U.S. Cl. 280—150.5 **3 Claims**



This invention relates to a method for extending the stabilizing stays of a mechanical earth-working vehicle, comprising at least two groups of stays capable of abutting on the ground, according to which method the stays of the first group are extended until they abut on fixed stops, wherein the stays of the second group are simultaneously extended into an intermediate position between the positions stays extended and stays retracted, determined as a function of the shape of the vehicle. The invention also relates to a stabilizing device applying the method as described above, wherein the stays are attached to hydraulic rams distributed in at least two groups capable of being supplied by a source of pressurized fluid, wherein an output divider is connected to the source of pressurized fluid by a conduit and to each of the two groups of stays by a conduit separated by a group of stays.

3,709,519

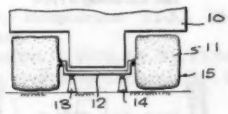
PROTECTIVE WHEEL ENCLOSURE

Edwin H. Burrows, 5700 Rock Creek Road, Agoura, Calif.

Filed April 8, 1971, Ser. No. 132,339

Int. Cl. B60r *27/00*

U.S. Cl. 280—150 R **4 Claims**



A protective wheel enclosure is disclosed herein for use with a stored vehicle to prevent or restrict damage to a selected wheel set thereof. The enclosure provides a bag-like container having an open mouth for insertably receiving a selected wheel set of the vehicle so that the wheels are completely enclosed and separated from its surrounding environment. A closure device detachably couples the mouth of the container about the axle of the vehicle to seal the interior of the container. A pouch of desiccator is incorporated into the interior of the enclosure to effect removal of moisture therefrom.

3,709,520

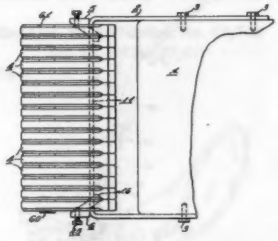
VEHICLE WEIGHT MOUNTING MEANS

Wayne E. Johnson, Milwaukee, and Eugene V. Korb, West Allis, both of Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 19, 1970, Ser. No. 91,079

Int. Cl. B60r *27/00*

U.S. Cl. 280—150 E **10 Claims**



A vehicle front end weight mounting means for stabilizing the front end of a vehicle and to provide positive traction for steering.

3,709,521

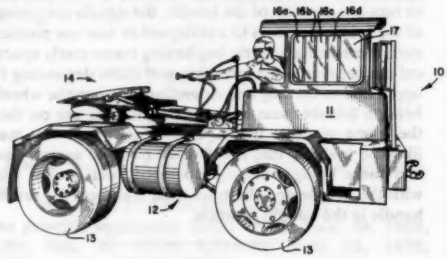
TUG VEHICLE WITH REAR CORNER WINDOW

Walter L. Davis, Sandy, Utah, assignor to Ibex, a Division of Jelco, Salt Lake City, Utah

Filed Aug. 9, 1971, Ser. No. 170,201

Int. Cl. B62d *53/00*; **B63d** *27/00*

U.S. Cl. 280—421 **5 Claims**



A corner window for use in tug type truck vehicles through which a driver can engage and disengage air lines and electrical hookups to a truck trailer. A number of individual window panes are hinged together, and rollers at the tops and bottoms of the couplings travel within tracks forming the bottom and top window casings. At least one sheet of flexible insulation material is arranged adjacent to the exterior of each window at the upper and lower tracks. The insulation material deforms to remain in continuous sealing contact with the window as the panes project beyond the tracks as the window negotiates the curves in the tracks.

3,709,522

TOWBAR APPARATUS

David C. Olson, Burbank, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

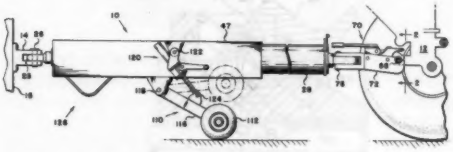
Filed Aug. 27, 1971, Ser. No. 175,666

Int. Cl. B60d *3/00*

U.S. Cl. 280—453 **3 Claims**

An apparatus for towing large vehicles, such as aircraft, and comprising an elongated braking drum, braking means offering frictional resistance to translation of and mounted about such drum and a recirculating ball bearing assembly disposed within and secured to the drum providing for the additional

bearing surfaces required under an overload condition for or on the towed device. The assembly is mounted on a screw member fixed to the towing end of the apparatus. The drum is connected at its towed end to a radial-and-thrust bearing coupling while the braking means is supported and fixed at a given position by a tube connecting the apparatus at its towing end to a latching mechanism. An axial load applied through the apparatus is absorbed by the frictional resistance provided between the braking means and drum. When a predetermined



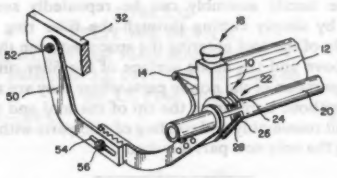
frictional value is exceeded, the apparatus begins to telescope, by reason of the drum rotating upon the screw member. This may provide for a signal to the operator that an overload on the towed device has occurred. The overload energy of the apparatus, nevertheless, is absorbed by heat generated between the braking means and the drum as the latter rotates, without making inoperative or damaging the apparatus, or disconnecting it from the towed device. The towbar may then be reset for continued operation.

3,709,523

HITCH BAR STABILIZER

James W. Ryden, Phoenix, Ariz., assignor to Advanced Management Engineering & Research Co., Phoenix, Ariz.

Filed Jan. 25, 1971, Ser. No. 109,429
Int. Cl. B60d *1/14*
U.S. Cl. 280—502 **5 Claims**



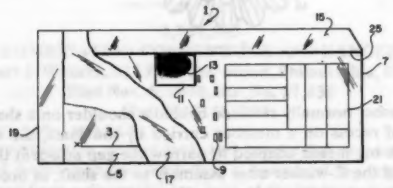
A stabilizer for hitch bar assemblies of the type supporting a ball socket for towing a trailer wherein the hitch bar assembly is mounted on a towing vehicle rear bumper by means of such as compressions clamps encircling the hitch bar and engageable with the bumper.

3,709,524

DOCUMENT IDENTIFICATION AND PROTECTION STEM

James B. McKee, Woodson Terrace, and Jon L. Canaday, Edmunson Terrace, both of Mo., assignors to Aid For Business, Incorporated, Woodson Terrace, Mo.

Filed June 16, 1971, Ser. No. 153,674
Int. Cl. B41l *1/24*
U.S. Cl. 282—22 R **15 Claims**



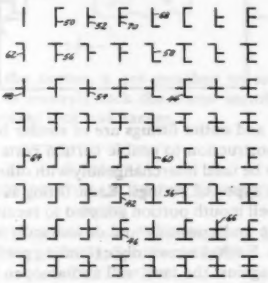
A sales slip packet includes a sales slip, a document card adapted for use in high-speed data processing apparatus and including a fingerprint receiving area, pressure sensitive copying means for transferring data from the sales slip to the document card, and a removable finger print medium wafer.

3,709,525

CHARACTER RECOGNITION

Alan I. Frank, Philadelphia, Pa., assignor to Scan-Data Corporation, Philadelphia, Pa.

Continuation of Ser. No. 544,202, April 21, 1966, abandoned.
This application Nov. 10, 1969, Ser. No. 871,550
Int. Cl. G06k *19/00*
U.S. Cl. 283—1 **1 Claim**



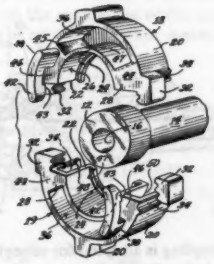
This invention relates to character recognition and more particularly to a method of editing a document prior to optical scanning thereof in a character recognition system.

3,709,526

MULTIPLE PIECE CLAMP FOR CONNECTING TUBING

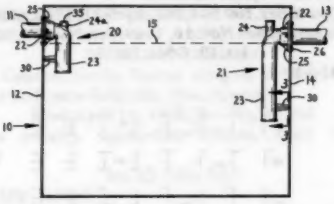
Harry W. Cromie, Pittsburgh, Pa., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed March 1, 1971, Ser. No. 120,014
Int. Cl. B60d *1/08*
U.S. Cl. 285—73 **12 Claims**



A clamp for securely holding ends of tubing together in end-to-end relationship is disclosed, in which the tubing so held carries a flange about its end. The clamp comprises four separable sections of identical shape, in which each section has means for locking together with another section to form two identical clamp halves. Each clamp half defines a bore to receive and hold tubing. The bore has an enlarged portion to receive and hold the tuning flange. Each clamp half also defines arms and slots positioned so that the arms of each clamp half are capable of engaging the slots of the other clamp half to secure the two halves together with the tuning ends mounted in each clamp half being secured together in end-to-end relationship.

3,709,527
SEPTIC TANK INLET AND OUTLET FITTINGS
Robert L. Nations, Beaverton, Oreg., assignor to Rich Manufacturing Company of Oregon, Portland, Oreg.
Filed April 7, 1971, Ser. No. 132,087
Int. Cl. F16l *3/00, 5/02*
U.S. Cl. 285—110 **3 Claims**

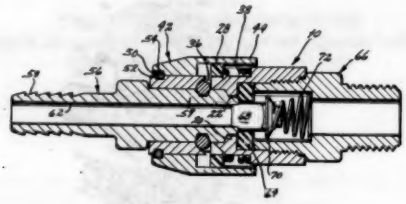


The inlet and outlet fittings are of similar but not identical cast-iron construction to enable certain parts of the patterns and cores to be used interchangeably with other parts for casting the two types of fittings. Each fitting is a tee having a horizontal bell mouth portion adapted to receive the end of an exterior pipe and upwardly and downwardly extending vertical portions. Each downwardly extending portion has a brace leg bearing against the tank wall and an open lower end. The upper end of the inlet fitting is closed to prevent back flow of gas from the septic tank into the house while the upper end of the outlet fitting is open to prevent syphoning.

ERRATUM

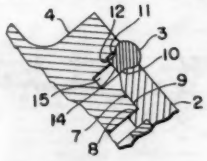
For Class 285—73 see:
Patent No. 3,709,526

3,709,528
HOSE COUPLING
Lee H. Cruse, Springfield, Mo., assignor to Foster Manufacturing Co., Inc., Springfield, Mo.
Continuation-in-part of Ser. No. 877,073, Nov. 17, 1969, abandoned. This application April 16, 1971, Ser. No. 134,701
Int. Cl. F16l *37/18*
U.S. Cl. 285—316 **12 Claims**



A hope coupling is adapted for receptive engagement with a male coupler element having an external annular groove. The hose coupling includes a tubular body having a longitudinally extending bore adapted to receive the male coupler element. At least one slot in the tubular body provides communication from outside the tubular body to the interior of the longitudinal bore. The slot extends axially along the tubular body and radially inwardly with respect to the longitudinal axis of the bore. A pin is mounted in the slot for movement therein from an inner position wherein it protrudes within the bore to an outer position wherein it is positioned outside the bore. A biasing guide collar for the pin includes oppositely disposed side wall members at the opposite ends of the pin and which collar is slidably mounted on the outside of the tubular body. A spring provided on the tubular body biases the collar to urge the pin into its inner position.

3,709,529
WELD JOINT
Robert T. Mains, Euclid, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Aug. 3, 1970, Ser. No. 60,589
Int. Cl. F16l *13/02*
U.S. Cl. 285—286 **5 Claims**



A weld joint for a fuel injection nozzle assembly and the like characterized in that axially interfitting tubular parts define therebetween an annular groove or gap of which one side has an axial step radially spaced outwardly from the bottom of the groove and radially spaced inwardly from the radially outer edge of the side of the groove. A metallic filler ring axially spans said groove and is coaxially located by said step to radially outwardly space its inside and outside surfaces respectively from the bottom of said groove and from the radially outer edges of the sides of said groove. The outside surface of the filler ring extends radially outward beyond the outer portions of the sides of the groove. The protruding portion of the weld ring permits fusion welding of the parts without addition of weld filler material. After the parts are welded together, the weld ring is integrally bonded to the adjacent portions of the sides of the groove to form a strong leakprrof joint between said nozzle parts. Another characterizing feature of the weld joint herein is that a flow divider valve or the like contained within the nozzle assembly can be repeatedly serviced or replaced by simply cutting through the filler ring with the point or tip of the tool entering the space between the bottom of the groove and the inside surface of the filler ring thus to permit separation of the nozzle parts where they are axially interfitted without burn up of the tip of the tool and to permit subsequent reassembly and welding of said parts with the filler ring being the only new part required.

3,709,530
AUXILIARY RETENTION FOR A C-WASHER
Wilford A. Redding, Route 1, Bailey, Mich.
Filed June 25, 1971, Ser. No. 156,675
Int. Cl. F16d *1/08*
U.S. Cl. 287—52.07 **1 Claim**

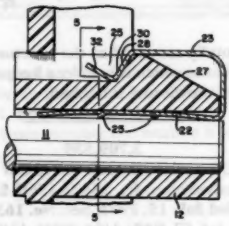
A C-washer normally retained behind a shoulder on a shaft by an end recess on a member carried by the shaft, the C-washer having means adapted to narrow the gap adjacent the opening of the C-washer after assembly to the shaft, in order to close the gap of the washer to a distance less than the shaft diameter and prevent disengagement of the washer on axial displacement on the member carried by the shaft.

3,709,531

SHAFT AND HUB ASSEMBLY AND IMPROVED CLIP FASTENER THEREFOR

Richard F. Beehler, Beach Grove, Ind., assignor to Lau Incorporated, Dayton, Ohio

Filed April 8, 1971, Ser. No. 132,347
Int. Cl. F16d 1/06
U.S. Cl. 287—53 H 6 Claims



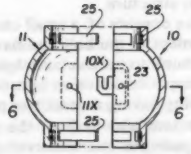
The fan hub is attached to a drive shaft by means of a generally C-shaped clip member which has an arched or curved leg positioned in a slot on the hub between the hub and a flat formed on the drive shaft. The clip member is first positioned on the shaft and then the hub is slid into place flattening the curvature of the leg of the clip member and driving a pair of barbs into frictional engagement with the shaft providing a torque and thrust transmitting connection. An upper portion of the clip member drops into a detent opening formed on the hub for retaining the clip member, hub, and shaft in assembled relation.

3,709,532

SPLIT TEE DEVICE

Joseph Caligiuri, 240 East 144th Street, Bronx, N.Y.

Filed Nov. 12, 1971, Ser. No. 198,140
Int. Cl. F16b 7/00
U.S. Cl. 287—54 C 2 Claims



This invention relates to a two-piece removable split-tee device adapted to removably hold a rod disposed transversely to a pair of parallel rods as in a jungle gym or a store display fixture. The device comprises two substantially mirror image half pieces slidably disposed along a fixed rod and adapted to secure a second rod at a right angle thereto. Hook means are provided in the two half pieces to produce a co-acting locking engagement therebetween.

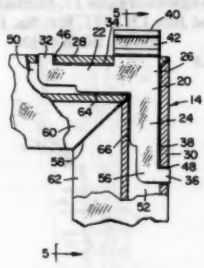
3,709,533

COMBINATION CORNER LOCK AND HANGER

Herbert J. Walters, 213 Fitzwater Street, Philadelphia, Pa.

Filed Nov. 6, 1970, Ser. No. 87,535
Int. Cl. F16b 7/22
U.S. Cl. 287—189.36 H 1 Claim

A combination corner lock and hanger for use with extruded frame members including a horizontal leg angularly disposed from a depending leg, both of the legs terminating in short projections extending at right angles thereto. The said corner lock terminates upwardly in a hanger which extends from the junction of the horizontal and depending legs. The adjoined frame members angularly connect in a mitered junction which is interiorly reinforced by the legs. Each frame



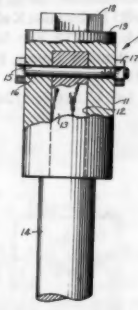
member forming the corner is pre-punched to receive the short projections to securely lock the frame members upon the combination corner lock and hanger.

3,709,534

ADAPTOR DEVICE FOR TRAILER DOLLY WHEELS AND PADS

William A. Coe, 20 Westfield Road, West Hartford, Conn.

Filed May 6, 1971, Ser. No. 141,065
Int. Cl. F16b 7/00
U.S. Cl. 287—119 1 Claim



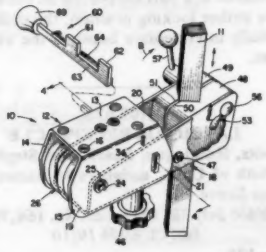
An adaptor for motorizing the crank operation of dolly wheels and pads. This device consists of a sleeve member which is secured by a bolt to the square end of the crank shaft so as to enable the shaft to be rotated by power means.

3,709,535

HINGE IRON FOR POSTURE CHAIR

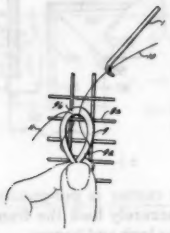
Heinz Rothermel, 604 Bloor Street West, Apt. B, Toronto, Ontario, Canada

Filed Jan. 18, 1971, Ser. No. 107,025
Int. Cl. A47c 7/44
U.S. Cl. 297—306 8 Claims



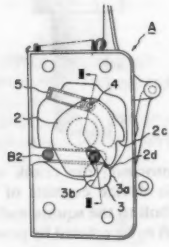
Spring-biassed hinge iron for a posture chair which hinge iron is readily adjustable by the user even while such a person is seated on the chair.

3,709,536
METHOD FOR MAKING A HAND KNOTTED PILE FABRIC
Angela Huber, Augustinergasse 17, Salzburg, Austria
Filed July 13, 1971, Ser. No. 162,039
Int. Cl. B65h 69/04
U.S. Cl. 289—1.5 7 Claims



Precut open pile loops consisting of a thick yarn, are tied to one side of a base fabric net by a thin tie yarn passing through the eye of a needle having an upturned point.

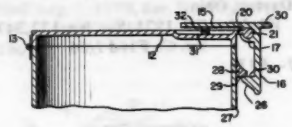
3,709,537
DOOR LOCKING DEVICE
Kenichi Kazaoka, and Nozomu Torii, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Japan
Filed Feb. 4, 1970, Ser. No. 8,614
Claims priority, application Japan, Feb. 8, 1969, 44/9474; Feb. 9, 1969, 44/12379
Int. Cl. E05c 3/24
U.S. Cl. 292—216 6 Claims



A striker of ring shape fixed to a doorway engages and rotates a disk latch rotatably supported on a corresponding door into a striker locking position when the door is closed, and the latch is thus held by a semicylindrical end of a detent having a cylindrical body, the semicylindrical end and cylindrical body being snugly but rotatably supported against transverse force respectively by semicylindrical and cylindrical concavities formed in a part supported on the door. When the latch is in the striker locking position, the striker is in a position substantially intermediate between the axes of the latch and the detent.

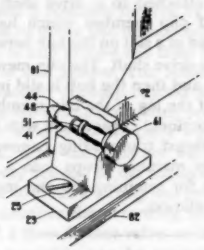
3,709,538
LATCH FOR RECEPTACLE
Lamont J. Seitz, Huntington Beach, and Stephen G. Hauser, Tarzana, both of Calif., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.
Filed July 28, 1971, Ser. No. 166,797
Int. Cl. E05c 19/10
U.S. Cl. 292—128 7 Claims

A latch is disclosed for a closure on a receptacle so that the closure may be easily retained in a latched condition and may easily be unlatched by manual operation employing one hand. The latch is mounted on a projection extending outwardly from said closure. The projection has mounted thereon, a member having generally an L-shaped configuration. The



member is pivotally mounted at the juncture of the two legs. One leg has a means which is held by a keeper mounted on the receptacle when the closure is latched.

3,709,539
SLIDING DOOR AND WINDOW LOCK
Conrad Fred Sodenkamp, Jr., 23423 156th S.E., Kent, Wash.
Filed July 15, 1971, Ser. No. 163,009
Int. Cl. E05c 1/04; B21k 13/00
U.S. Cl. 292—145 9 Claims



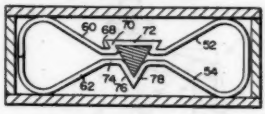
A sliding door and/or sliding window locking device attaches to a door frame or window sill or other casing portions on the inside using wood or sheet metal screws. Locking of the sliding member or members occurs as a bolt of the locking device is moved to protrude into the path of each sliding member to abut its edge or is moved into a hole drilled into each sliding member structure.

The locking device consists of: a small cast housing for containment and alignment of the bolt and having two base lugs drilled and countersunk to receive attachment screws; a bolt extending in each opposite direction beyond the housing and slidable in the housing having at least two portions of respective constant diameters and in line, the portion of larger diameter having a generous chamfer over about one third of its length, terminating in a radial plane end surface having a pointed tip in the center useful for punching a location marker indent before drilling a locking bolt receiving hole in the sliding member structure; a bushing of Teflon, Nylon or equivalent plastic for the bolt sized to provide a comfortable fit between the smaller diameter portion of the locking bolt and a respective counterbore portion of the interior of the housing; and a knob for finger manipulation blind bored undersized and press fitted to the smaller diameter of the bolt extending beyond the housing, the knob being knurled for a better grip.

3,709,540
TURN LOCK
Herbert J. Bellis, c/o Bellis Industries, Inc. 196 Wallabout Street, Brooklyn, N.Y.
Filed Oct. 7, 1970, Ser. No. 78,869
Int. Cl. E05c 3/04
U.S. Cl. 292—204 7 Claims

A turn lock having a locking element with a square post depending therefrom. A locking element support has a base with an opening extending therethrough and flanges extending per-

pendicularly away from the base edges in the same direction to form a rectangular cup. The post extends through the base opening and is flanked by the cup. An hour-glass shaped resilient strip locking means is held in the cup and has the opposite sides of its neck configured to opposed V-shaped formations that resiliently engage all four sides of the post in both open and closed positions of the locking element. This prevents the post from swaying and enables it to be detained in both said positions.



3,709,541

CASINGS FOR A ROLLER OR BOLT IN A SLIDING DOOR FITTING

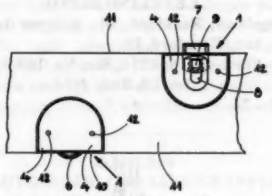
Heinrich Lauterbach, Nurnberg, Germany, assignor to Trola Kunststofferzeugnisse Gesellschaft mit beschrankter Haftung & Co., Nurnberg, Germany

Filed Feb. 5, 1971, Ser. No. 112,866

Claims priority, application Germany, March 17, 1970, P 70 09 771.6

Int. Cl. E05c *9/00*

U.S. Cl. 292—337 **4 Claims**



This invention relates to casing for rollers or bolts for use in sliding door fittings. Such casings may be in the form of a major segment of a circle with the bounding chord located along the edge of the sliding door. In order to fit these casings without screws the outer sidewall has previously been made with elastically deformable toothing, but this itself has led to difficulties in removing the casing. In order to make the casing capable of revolution through 90° and still have a clearance between the bounding chord and the edge of the aperture in the door edge, the bounding chord is made shorter than the side of the inscribed square to the circle, i.e., the height of the arc of the segmental casing is not more than 86 percent of the diameter of the circle.

3,709,542

TRAILER BUMPER

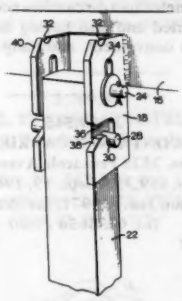
Bert H. Fehlau, Mississauga, Ontario, and Garrit A. Domerchie, Toronto, Ontario, both of Canada, assignors to Highway Trailers of Canada Limited, Cooksville, Ontario, Canada

Filed Nov. 30, 1970, Ser. No. 93,631

Int. Cl. B60r *19/04*

U.S. Cl. 293—73 **8 Claims**

A bumper for a trailer unit may be locked in alternative positions relative to a retaining bracket attached to the trailer unit. The two positions are respectively one in which the bumper projects below a horizontal plane including the point of attachment of the bracket to trailer unit and one in which the bumper projects above the horizontal plane.



3,709,543

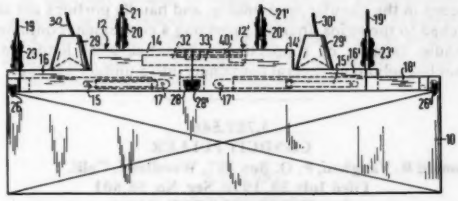
LOADING CRANE FOR SHIPPING CONTAINERS OF DIFFERENT SIZE

Hans Tax, and Rudiger Franke, both of Munich, Germany, assignors to said Tax, by said Franke

Filed Oct. 19, 1970, Ser. No. 82,106

Int. Cl. B66c *1/00*

U.S. Cl. 294—81 SF **15 Claims**



A crane for loading and unloading container ships and for otherwise handling large containers is equipped with two elongated lifting frames suspended from the cables or ropes of two hoists in such a manner that the frames may be longitudinally aligned in end-to-end relationship. Each frame is equipped to be lengthened in a direction away from the other frame by 5 ft. to 20 ft. of effective length, and the frames may be rigidly coupled so that the frame, singly or jointly, may carry any container having a length of 15, 20, 30, 35, or 40 feet.

3,709,544

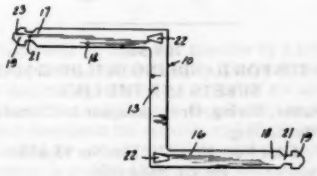
CONTAINER CARRIER

George F. Oltmanns, 2528 Rensacola Avenue, Chicago, Ill.

Filed Feb. 24, 1971, Ser. No. 118,407

Int. Cl. A47j *45/00*

U.S. Cl. 294—31.2 **3 Claims**



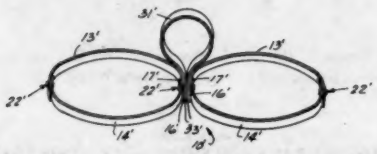
A carrier for one or more substantially cylindrical containers of the type having a lip or peripheral engagement com-

prises a sheet-form blank composed of transversely rigid, somewhat elastic and flexible material having container-gripping strap portions disposed in circular arrangements corresponding in diameter to a circumference of the container to be gripped or carried and also having handle strap portions formed to provide convenient, manually engageable handles for the container.

3,709,545
CONTAINER CARRIER

George F. Oltmanns, 2528 Pensacola Avenue, Chicago, Ill.

Division of Ser. No. 859,353, Sept. 19, 1969, abandoned. This application Jan. 6, 1971, Ser. No. 104,506
Int. Cl. B65d *71/00*
U.S. Cl. 294—31.2 **2 Claims**

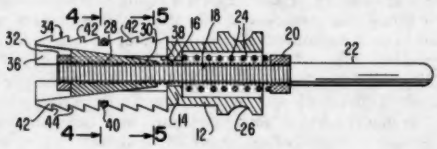


A carrier for one or more substantially cylindrical containers having a peripheral enlargement comprises strip-form means composed of transversely rigid material disposed in circular arrangements corresponding in diameter to a circumference of the container and about axes extending transversely of the strip. The strip-form means have apertured overlapping portions receiving fastening means for retaining the strip form means in the circular relationship, and handle portions are attached to the strips, thereby providing a convenient container handle capable of supporting substantial axial loads and enabling adjoining several containers into a unitary package.

3,709,546
CONDUIT PULLER

Donald R. Vaughan, P. O. Box 297, Woodland, Calif.

Filed July 20, 1970, Ser. No. 56,601
Int. Cl. B66c *1/54*; B23b *31/40*
U.S. Cl. 294—96 **2 Claims**



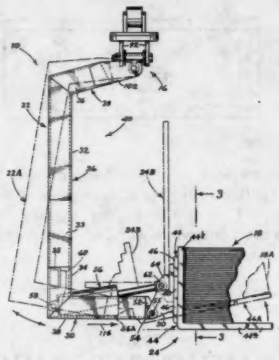
A device adapted to be inserted into one end of a conduit and for releasably engaging the inner surface of the conduit to allow the latter to be pulled by the device in one direction. The device has a cam member, a number of toothed elements slidable along the cam member and frictionally engageable with the inner surface of the conduit, and means for forcing the elements along the member to move the elements radially outwardly thereof effectively increase the diameter of the elements.

3,709,547
APPARATUS FOR HANDLING BUILDING MATERIAL SHEETS AND THE LIKE

Ralph E. Nutter, Boring, Oreg., assignor to Cascade Corporation, Portland, Oreg.

Filed Nov. 30, 1970, Ser. No. 93,635
Int. Cl. B66c *1/00*
U.S. Cl. 294—67 AA **2 Claims**

Apparatus suspendible from a boom and the like for handling a stack of generally rigid sheet-like articles. The apparatus includes a rigid frame which is somewhat C-shaped as viewed from one of its sides, with the frame including a generally upright cradle having an open laterally facing side for receiving a stack of sheets with the latter on edge in the

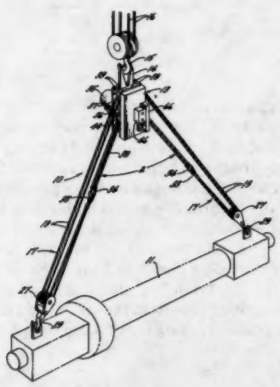


cradle. Power-operated lift forks pivoted to the base of the frame are swingable between a lowered position for picking up and depositing a stack and a raised position for placing a stack within the cradle. In the raised position, the forks substantially close off the open side of the cradle.

3,709,548
LEVELING SLING

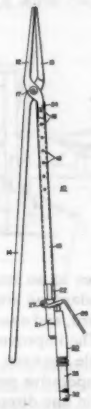
Fred G. Hogshead, Rockford, Ill., assignor to The Caldwell Company, Inc., Rockford, Ill.

Filed Aug. 6, 1971, Ser. No. 169,736
Int. Cl. B66c *1/14*
U.S. Cl. 294—74 **7 Claims**



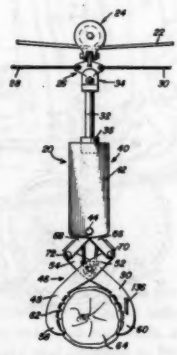
A sling for carrying a load includes a frame with a gripper mounted thereon and a cable extends across the gripper and is held thereby against movement when the load is lifted. The ends of the cable are doubled back toward the frame and connected with each other by a chain to form two elongated loop portions which are disposed on opposite sides of the frame and function as the two legs of the sling. The chain is trained across a drive sprocket which is mounted on the frame vertically of the gripper and is driven by a motor to draw the chain across the frame from one side to the other and thereby selectively shorten one loop portion while lengthening the other loop portion to adjust the load to a precise attitude after the load has been lifted.

3,709,549
LUBRICATING TONGS
John W. Severs, Buena Park, Calif., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed March 23, 1971, Ser. No. 127,223
Int. Cl. B25b 7/22
U.S. Cl. 294—118 3 Claims



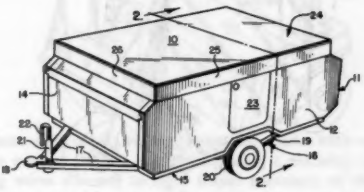
A hand tongs device providing a single workman with the capability of handling a workpiece, such as a forging, while simultaneously lubricating the dies of a press. The device comprises a pivotal set of hand tongs, at least one handle of which is a hollow tube, the hollow tube handle having nozzle openings in the wall thereof adjacent finger portions of the tongs employed to grasp a workpiece. At the other end of the hollow handle, and connected in fluid communication therewith, is a hand operable valve device, for permitting the flow of lubricant through the valve handle and openings from a pressurized source thereof, when the valve is opened.

3,709,550
AUTOMATIC ONE LINE GRAPPLE
John H. Mitchell, 512 Westerly Drive, Aberdeen, Wash.
Filed May 10, 1967, Ser. No. 637,565
Int. Cl. B66c 1/00
U.S. Cl. 294—111 7 Claims



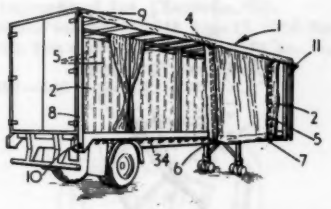
A grapple employed in the logging industry which includes a pair of tongs which are automatically opened and closed while being hung or supported from a single line or support and which is especially useful in highlead grapple yarding. The tongs are opened and closed in a single cycle of operation or a multiple cycle of operation which renders the grapple quite useful in turning or rotating a log. The tongs of the grapple are either supported from a supporting pin and linkage in which position the tongs are in closed or adjacent position or supported from a pin interconnecting the crossed tongs which pivots the tongs to an open position with the supporting function being sequential in response to movement of the grapple in a predetermined manner.

3,709,551
TRAVEL TRAILER CONSTRUCTION
James F. McCarthy, Broadview, Ill., assignor to Free Winds, Inc., Geneva, Ill.
Continuation of Ser. No. 767,343, Oct. 14, 1968, Pat. No. 3,560,042. This application Jan. 28, 1971, Ser. No. 110,562
Int. Cl. B60p 3/34
U.S. Cl. 296—23 R 3 Claims



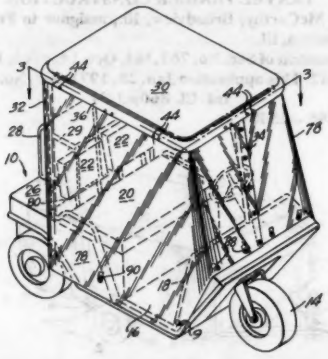
A trailer construction adapted to be attached to and drawn rearwardly of a motor vehicle when in a relatively compact condition and which is capable, when unhitched or detached from the draft vehicle, of being quickly and easily expanded vertically as well as fore and aft by the interaction of a plurality of foldable and slidable solid or rigid panels to provide a weathertight and waterproof enclosure of relatively large interior dimensions suitable for living quarters.

3,709,552
VAN BODIES
Edward Gerald Broadbent, Sandbach, England, assignor to Shellag Estates Limited, Douglas, Isle of Man, Great Britain
Filed Oct. 12, 1970, Ser. No. 80,098
Claims priority, application Great Britain, Oct. 10, 1969, 49,786/69
Int. Cl. B60j 5/06
U.S. Cl. 296—28 M 16 Claims



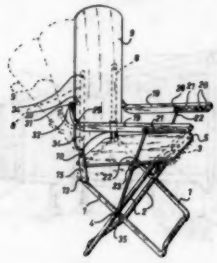
A van body with an open side closable by a sliding curtain suspended from the roof of the body. One vertical edge of the curtain is detachably secured to an end of the open side and the other vertical curtain edge is detachably connected with a rotary spool element at the opposite end of the open side onto which curtain is wound for horizontal tensioning. Spool locking means is provided to prevent slackening of the tensioned curtain. The curtain is also tensioned vertically by straps which connect between travelling elements by which the curtain is suspended and anchorages on the body.

3,709,553
GOLF CAR RAIN COAT
Charles W. Churchill, and Herbert E. Bixby, both of P.O. Box 12653, Lake Park, Fla.
Filed Feb. 17, 1971, Ser. No. 115,970
Int. Cl. B60j 9/00
U.S. Cl. 296—28 C 2 Claims



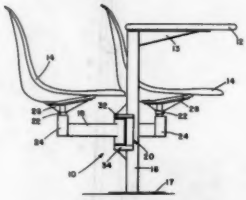
A roofed golf car has its passenger compartment weatherproofed by a pair of flexible transparent plastic curtains. Each curtain is supported by a channel-shaped guide member, one at each side of the car, and each curtain is slidable on its guide member. Each guide member has a plurality of supports connected to the car roof. Each curtain may be compressed into a bundle at one side of the car when not in use. A special curtain is provided to cover the conventional club compartment of the car during rain storms.

3,709,554
ADJUSTABLE CHAIR
Tibor Feher, 5130 Bourret Avenue, Apt. 9, Montreal, Quebec, Canada
Filed Dec. 2, 1970, Ser. No. 94,302
Int. Cl. A47c 4/24
U.S. Cl. 297—26 4 Claims



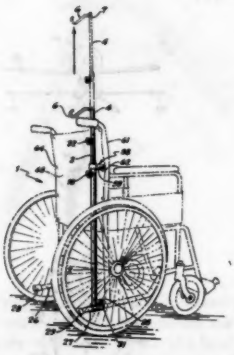
An article of furniture more particularly a chair of the nonfolding or folding type, in which both the seat and back-rest can be adjustably inclined in a separate and independent manner to provide a great number of postures. The arm-rests, which are pivoted to the back-rest and are used to incline the same, are arranged to remain level despite change in the back-rest inclination. The article of furniture may constitute a leg holder with an adjustably inclinable leg support panel equivalent to the chair seat.

3,709,555
BIAS RELIEVED AUTOMATIC SEAT RETURN
Hubert L. Ostertag, Holland, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed March 3, 1971, Ser. No. 120,400
Int. Cl. A47c 3/18
U.S. Cl. 297—142 14 Claims



This disclosure relates to an improved support for a seat having a stationary standard, an arm pivotally mounted at one of its ends on the standard, and a seat member mounted on the other end of the arm. The improved structure disclosed has a biasing element shiftable between operative and inoperative positions. When in an operative position, the biasing element urges the arm to pivot in one direction about the standard to assume a storage position. In response to the weight of a person on the seat member, the biasing element is rendered inoperative, and the arm becomes freely movable about the support.

3,709,556
TELESCOPING I V POLE ATTACHMENT AND WHEEL CHAIRS
Eugene R. Allard, 1809 A Pearl, Alameda, Calif., and Charles D. Allard, 1620 Hickory Avenue, San Leandro, Calif.
Filed Oct. 16, 1970, Ser. No. 81,329
Int. Cl. A47c 7/62
U.S. Cl. 297—188 2 Claims

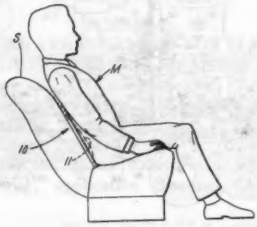


A holder for containers of liquids for intravenous feedings for attachment to portable patient conveyances such as wheel chairs and gurneys consisting of an elongated tubular base, brackets for attachment to the frame of the conveyance, a plurality of elongated tubular extension members arranged for telescoping registration within the base and a hook shaped member mounted on the distal end of the uppermost telescoping member for holding the intravenous feeding container.

3,709,557
PORTABLE VERTEBRAL COLUMN SUPPORT

Richard U. Light, Delton, Mich., assignor to Flat-Back Corporation, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 852,693, Aug. 25, 1969, abandoned.
Filed Aug. 12, 1970, Ser. No. 63,253
Int. Cl. A47c 7/42
U.S. Cl. 297—230 4 Claims

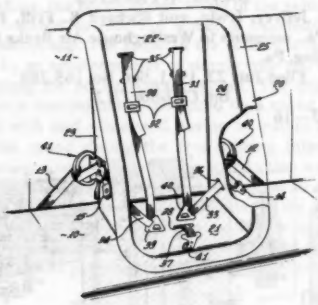


A portable vertebral column support for use in chairs and the like to support the vertebral column of the user. The support comprises an elongated flexible envelope having at least a pair of spaced apart elongated pockets therein extending parallel to one another and parallel to the user's vertebral column when in a position of use. Each of the pockets has a closable end adjacent one end thereof for receiving removable rigidifying means therein to rigidify the flexible envelope to provide the necessary support for the vertebral column.

3,709,558
CHILD SAFETY SEAT

Hans Jakob, Sherman Oaks, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Oct. 13, 1971, Ser. No. 188,855
Int. Cl. A47d 1/10
U.S. Cl. 297—250 8 Claims

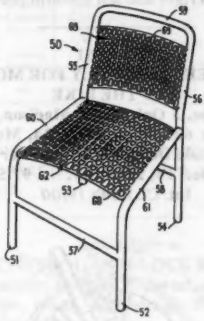


A safety restraint device for a child for use with a vehicle seat and the conventionally installed safety belt including a body having bottom, rear and sidewalls, a plurality of straps connected to the body and adapted to be releasably secured about a child, and at least two spaced apart connecting devices for releasably securing the body to the vehicle seat through the safety belt, the connecting devices including a pair of D-shaped rings which are pivotally mounted in a sleeve that is fixedly mounted to the body and a strap end securing device mounted on the body for supporting the free end of the lap strap after it is engaged with the D-rings to aid in preventing disengagement between the rings and straps.

3,709,559
FURNITURE FOR SEATING PEOPLE

David L. Rowland, 49 West 55th Street, New York, N.Y.

Filed March 22, 1971, Ser. No. 126,576
Int. Cl. A47c 4/00, 7/00
U.S. Cl. 297—445 41 Claims

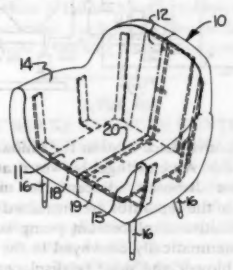


Chairs and other seating units are made with seats and, where present, backs, each comprising a plurality of sinuous spring wires secured to rigid frame members of the seating units, these rigid frame members being themselves held apart by one or more other rigid frame members. The sinuous spring wires are in their natural state shaped in circular or cylindrical arcs which are partially but not completely flattened in the completed seats and backs, to place the springs in tension and to aid in their retention by the frame. The spring wires touch or come quite close to each other at least once per cycle, and a thin sleevelike plastic coating surrounds the wires and follows their sinuous shape. It also surrounds the rigid frame members to which they are secured and links the wires and frame together and links the wires to each other wherever they touch, to provide a unitary seat or back assembly. The springs are, however, secured firmly to the frame, and the plastic is not relied on for rigid attachment. In preferred forms of the invention, the plastic coating has a Shore A durometer between 45 and 90, so that the assembly is held together by the plastic coating without substantially restraining the flexing of the spring wires, and the coating itself provides a spring action between adjacent wires by stretching and contracting, thereby giving a two-way stretch action.

3,709,560
SEATING FURNITURE AND METHOD OF MANUFACTURING SUCH FURNITURE

Heinz Binek, Freckenhorst, Germany, assignor to Consolidated Burris International, Ltd., Lincolnton, N.C.

Division of Ser. No. 736,831, June 13, 1968, Pat. No. 3,564,700. This application Aug. 18, 1970, Ser. No. 64,733
Int. Cl. A47c 4/02, 7/00
U.S. Cl. 297—445 1 Claim



Multiple person seating furniture pieces, such as couches and the like, are disclosed as being produced in accordance

with a method wherein synthetic foam material is formed into a chair body having a seat, a backrest, and right and left sidearm portions. The chair body thereafter is severed to produce a pair of end sections which are then joined with an intermediate section to complete the assembly of a couch body having a seat and backrest terminating at respective ends of the couch body in right and left sidearm portions.

3,709,561

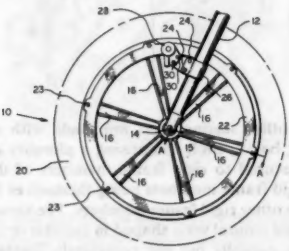
BRAKE AND WHEEL ASSEMBLY FOR MOTORCYCLES AND THE LIKE

Richard L. De Biasse, 3 Oak Street, Madison, and Warren L. Harvey, P.O. Box 622, West Route 24, Mendham, both of N.J., assignors to said De Biasse, by said Harvey

Filed Dec. 14, 1970, Ser. No. 97,595

Int. Cl. B60b *19/00*

U.S. Cl. 301—6 E **8 Claims**



A lightweight rigid wheel assembly for motorcycles and the like. The wheel is formed in one piece and includes a relatively small number of spokes, each spoke acting to support the wheel during full rotation and being "I"-shaped in cross section. The connecting web portion of each spoke tapers from the rim toward the hub and the connected flange portions taper from the hub toward the rim. A brake disk is attached to the rim for use with a suitable brake caliber attached to the motorcycle frame.

3,709,562

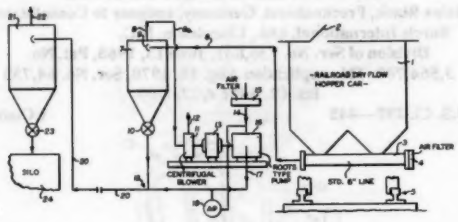
PNEUMATIC CONVEYANCE SYSTEM

Friedhelm R. Feder, Memphis, Tenn., assignor to Wedco, Inc., Bloomsbury, N.J.

Filed July 21, 1971, Ser. No. 164,554

Int. Cl. B65g *53/04*

U.S. Cl. 302—13 **20 Claims**



A pneumatic conveyance system for unloading a dry flow railroad hopper car. A centrifugal blower draws suction on a cyclone separator disposed adjacent the unloading point. Solids separated in the separator are entrained in an air stream provided by a positive displacement pump such as a Root's pump and are pneumatically conveyed to the delivery point. The centrifugal blower and positive displacement pump are driven by the same motor so that the air rate-power characteristics of the centrifugal blower and positive displacement pump counteract each other.

3,709,563

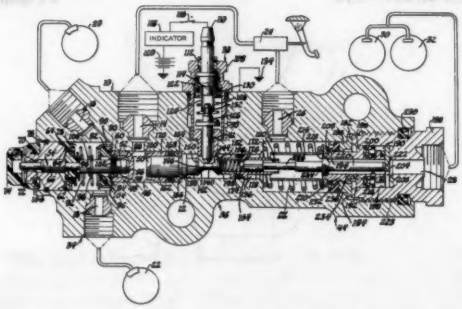
METERING VALVE ASSEMBLY FOR COMBINATION VALVE

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 17, 1970, Ser. No. 72,987

Int. Cl. B60t *8/26, 11/34, 17/22*

U.S. Cl. 303—6 C **5 Claims**



A metering valve assembly for the front disc brakes of a dual circuit brake system which has rear drum brakes. The metering valve assembly is disclosed as a part of a combination valve assembly for a dual circuit brake system in which the metering valve is in one circuit, a proportioning valve is in the other circuit, and a hydraulically reset pressure loss warning indicator unit is sensitive to both circuits. The metering valve assembly has a metering valve pin provided with a grooved or knurled land and a smooth surfaced land in the valving section of the pin, and a rubber-like, resilient metering valve member mounted about the pin and having an outer section cooperating with a shoulder on the metering valve housing to form a first valve and an inner section extending axially over the valving section area of the pin and cooperating with that valving section to form a second valve.

3,709,564

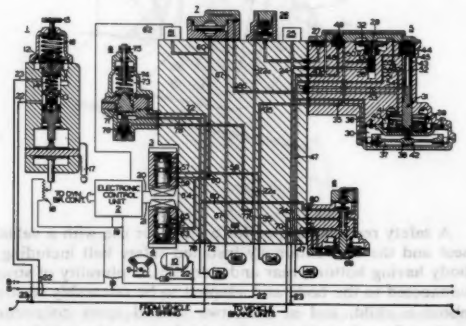
COMBINED ELECTRONIC AND FLUID PRESSURE BRAKE APPARATUS

William B. Jeffrey, Irwin, and Richard K. Frill, Pittsburgh, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed July 22, 1971, Ser. No. 165,288

Int. Cl. B60t *7/12*

U.S. Cl. 303—16 **9 Claims**



A rapid transit type railway brake control system in which an electronic operating unit is employed to normally regulate electro-pneumatic control of the friction brakes in a manner to continuously supplement the effective dynamic brake sufficient to satisfy the brake demand input. Flow of electric cur-

rent in a control wire (P-wire) monitored by the electronic control unit is selectively varied to provide the brake demand input to the electronic unit in accordance with operation of a controller device which is adapted to concurrently vary brake pipe pressure in parallel with control wire current. The improvement resides in means for rendering a service brake control valve automatically responsive to variation of brake pipe pressure to provide automatic-pneumatic control of the friction brake consequent to a malfunction rendering the normal electro-pneumatic brake control inoperative.

3,709,565

METHOD AND ARRANGEMENT FOR ELECTRONIC CONTROL OF THE BRAKING MEANS OF WHEELED VEHICLES

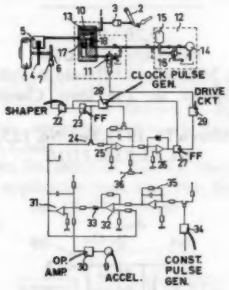
Arne Holger Jonason, Angered, and Gosta Holger Granlund, Goteborg, both of Sweden, assignors to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Oct. 26, 1970, Ser. No. 83,747

Claims priority, application Sweden, Oct. 27, 1969, 14652/69

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 BE **2 Claims**



In a motor car or other wheeled vehicle provided with electronically controlled wheel brakes, the lag or slip of the individual wheels is determined to render possible a control such that locking and skidding of the wheels is prevented. During braking, the brake of one wheel of the vehicle is intermittently released so that the wheel is intermittently free-running without slip. The speed of the vehicle is continuously measured by an accelerometer of simple type and an integrator integrating the accelerometer output. The true speed of the vehicle is intermittently measured by a speed transducer associated with said wheel and having an output representative of true speed during the free-running interval of the wheel. The approximate continuous speed value is recurrently updated by the intermittent true speed signal so that the integrator output is proportional to the ratio of the speed of the vehicle to that of the wheel and is a quantity to control the brake of the wheel in dependence of the slip of the wheel by comparison with a permissible or tolerable slip limit value.

3,709,566

METHOD AND APPARATUS FOR THE ANTI-SKID BRAKING OF VEHICLES

Giancarlo Michellone, Cambiano; Mario Palazzetti, and Giovanni Tabasso, both of Turin, all of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

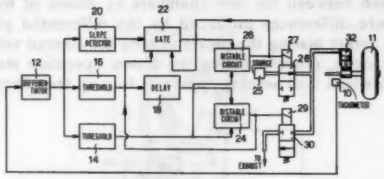
Filed Feb. 24, 1971, Ser. No. 118,259

Claims priority, application Italy, March 9, 1970, 67781 A/70

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 BE **4 Claims**

A vehicle anti-skid braking system which shortens the time required to reduce an excessive slip of the wheel by ascertaining the instant when the wheel acceleration becomes zero after braking has been released and by keeping constant the braking torque on the wheel at the value it reaches after a predetermined time has elapsed from such instant, braking being resumed when the acceleration of the wheel again begins to decrease.



3,709,567

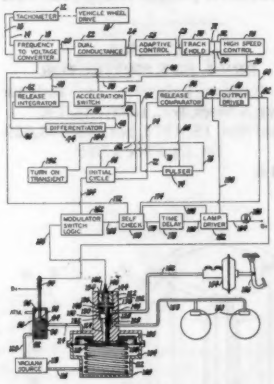
ADAPTIVE CONTROL ANTI-LOCK BRAKE SYSTEM

David L. Van Ostrom; Douglas W. Sweet, and David G. Beyerlein, all of Flint, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 806,807, March 13, 1969, abandoned. This application March 26, 1971, Ser. No. 128,484

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 BE **20 Claims**



A system for preventing the locking of vehicle wheels during braking includes an electronic control responsive to the velocity of the braked wheel for generating a signal which roughly simulates the vehicle deceleration and compares that signal with one representing wheel deceleration and derives an integrated control signal as a function of the difference between simulated vehicle and wheel velocities. The control signal operates a solenoid valve in a pneumatic circuit which controls a brake pressure modulator for releasing and applying the wheel brakes. A failure sensing circuit monitors critical points in the electronic control and the modulator to disable the control and light a warning lamp upon detecting a failure.

3,709,568

HYDRAULIC BRAKE PRESSURE CONTROL SYSTEM AND METHOD FOR VEHICLES

Hirotaka Miyake, and Shinji Kawai, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Japan

Filed May 8, 1970, Ser. No. 35,632

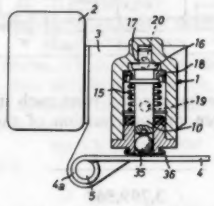
Claims priority, application Japan, May 11, 1969, 44/35701; May 11, 1969, 44/42737

Int. Cl. B60t *8/20*

U.S. Cl. 303—22 R **11 Claims**

In a hydraulic brake pressure control system for vehicles having a brake regulator comprising a cylinder, a differential

piston provided with small and large effective surfaces and engaged in the cylinder, which subdivides the cylinder inside into two chambers, a control valve to open or shut off intercommunication between the two chambers by means of hydraulic pressure differences produced by the differential piston, a valve spring biasing the piston to hold the control valve normally open, predetermining the piston operation start, and also a wheel load sensing apparatus to vary the effect of the



valve spring in response to changes of the distance between the two masses separated by the vehicle suspension system, improvements, wherein, are to make the wheel load sensing apparatus have little effect toward the piston in the intermediate point of the largest relative changing amount between the two masses, the valve starting its operation only by the predetermined load of the valve spring and also to increase and decrease the biasing force of the valve spring onto the piston with a switchover point of said intermediate one.

3,709,569

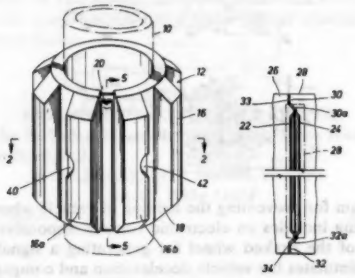
DRILL PIPE PROTECTOR

Mason Wayne Napper, Lafayette, La., assignor to Galaxie Manufacturing & Sales, Inc., Lafayette, La.

Filed Nov. 15, 1971, Ser. No. 198,629

Int. Cl. F16c *17/00*

U.S. Cl. 308—4 A **5 Claims**



A novel latching mechanism is provided for a drill pipe protector of the split ring type. The latch mechanism includes hook members located on the either side of the "split," which are secured in place around a drill string by a C-clip which slides longitudinally. Tabs on each end of the split permit ready longitudinal alignment of hook members for sliding of the C-clip into place.

3,709,570

ANTI-FRICTION BEARING HOUSING

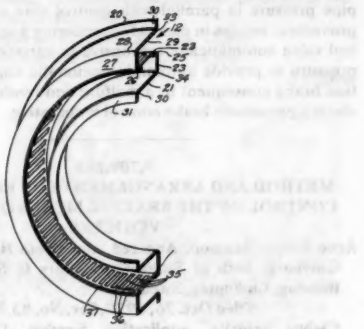
Anthony T. Galbato, Jamestown, N.Y., assignor to TRW Inc., Cleveland, Ohio

Filed Dec. 28, 1970, Ser. No. 101,936

Int. Cl. F16c *35/06*

U.S. Cl. 308—26 **13 Claims**

A resilient damper assembly for connecting an anti-friction bearing assembly to a housing, the resilient damper assembly consisting of three parallel radially spaced-apart lands, the outer land connected to the center land by a radially extending land at one end and the inner land connected to the center land by a radially extending land at the other end thereof, the center land having a plurality of radial slots therethrough to



provide bending bars. In a second embodiment, the resilient land comprises a U-shaped cross section circumferentially around the bearing race assembly which is radially flexible.

3,709,571

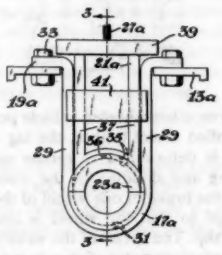
BEARING HOLDER

John A. Croisant, Midland, and Harold D. Folts, Rhodes, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed March 11, 1971, Ser. No. 123,283

Int. Cl. F16c *35/10*

U.S. Cl. 308—27 **8 Claims**



A support for bearings is described which comprises a support member with an inner wall portion of a closed end having a configuration adapted to engage a bearing wall portion; a releasable bearing restraining member slidably received within the support member with an outer wall portion at a first end thereof adapted to engage the bearing wall portion substantially simultaneously with the engaging of the bearing by the support member; and a clamping means in operative combination with a second end of the restraining member to exert a sufficient force on the restraining member to restrain the bearing within the inner and outer wall portions.

3,709,572

REVERSIBLE SHIELD-SEAL FOR A BEARING

James J. Pethis, Farmington, Conn., assignor to Textron Inc., Providence, R.I.

Filed Dec. 16, 1970, Ser. No. 98,616

Int. Cl. F16c *33/78, 33/80*

U.S. Cl. 308—187.2 **10 Claims**

The invention contemplates a single annular disc element with elastomeric formations so sized and proportioned that, when installed in a suitable retaining groove of one of the rings of an antifriction bearing or the like, the disc element will close the gap between bearing rings and will provide selective availability of a seal function or of a shield function, depend-

ing upon the axial orientation of the disc element in its assembly to the retaining groove. Specifically, in cooperation with a tapering surface of the other bearing ring (i.e. the ring which rotates with respect to the grooved ring), the disc element will position an elastomeric seal lip in light resiliently

deflected interference with the tapered surface, for one assembled orientation; on the other hand, for the axially-reversed assembled orientation, the disc element positions the seal lip in close-clearance relation with the tapered surface, to provide a shield function. Various further features are also provided.

3,709,573

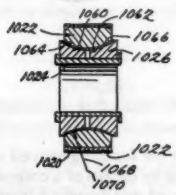
SPLIT-RACE BEARING CONSTRUCTION

Stanley S. Orkin, Rockville, and Richard W. Hartwick, Granby, both of Conn., assignors to Kacarb Products Corporation, Bloomfield, Conn.

Division of Ser. No. 800,143, Feb. 18, 1969, Pat. No. 3,578,828. This application Sept. 10, 1970, Ser. No. 71,223

Int. Cl. F16c *17/00*

U.S. Cl. 308—161 **2 Claims**



A dry, self-lubricating bearing comprises an outer and an inner race with coengaging bearing surfaces with the bearing surfaces on one race being made of a solid lubricant material and the bearing surfaces on the other race being made of a hardened material such as a thin ceramic coating on a metal substrate. In one embodiment, the outer race comprises a single member while the inner race comprises two separate members slidably carried within opposed seats of the outer race with the bearing being capable of absorbing radial, axial and moment loading individually or in combination. In other embodiments, the outer race is split comprising two members and/or the outer race is carried within concave seats of the inner race.

3,709,574

LOCKING DEVICE FOR A BEARING OR THE LIKE

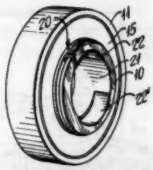
Howell L. Potter, New Britain, Conn., assignor to Textron, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 134,649, April 16, 1971, abandoned. This application Sept. 9, 1971, Ser. No. 179,008

Int. Cl. F16c *35/06*

U.S. Cl. 308—236 **23 Claims**

The invention contemplates clip means having relatively free but unit-handling assembled relation to the bearing ring or the like which it is to secure, in the ultimately fitted, installed condition of the ring. An axial tongue of the clip is held in an eccentric arcuate relief in the cylindrical ring surface to



be mounted. The assembled and installed position of the ring is secured by angularly displacing the clip, and therefore the tongue, toward one of the circumferential limits of the relief.

3,709,575

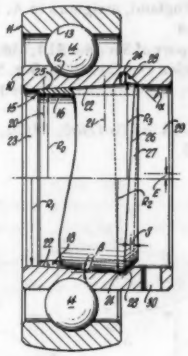
SHAFT LOCKING DEVICE

Ralph S. Howe, Jr., New Britain, Colo., assignor to Textron Inc., Providence, R.I.

Filed April 19, 1971, Ser. No. 135,314

Int. Cl. F16c *35/06*

U.S. Cl. 308—236 **19 Claims**



The invention provides means for concentrically mounting a ring on a shaft and for automatically locking the same. Only one sleeve part is required, in addition to the ring. Reliance is placed on first coacting mated tapering surfaces on the sleeve and ring bore, to establish the concentric relation, and upon second coacting cam formations integral with the sleeve and ring, to establish axially cammed displacement of the ring and sleeve into locked concentric relation. In the forms disclosed, the sleeve is split and may have frictional interference with the mounting-shaft size, and the sleeve is held captive, in unit-handling assembled relation within the ring bore. Also, in the forms disclosed, the ring is the inner race ring of an antifriction bearing, and the concentric tapering surfaces are positioned to directly radially and concentrically support the raceway region.

3,709,576

REFRIGERATOR DOOR LINERS

Marcel Lemoine, Montlignon, France, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 10, 1971, Ser. No. 114,272

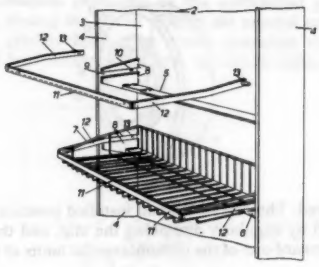
Claims priority, application Great Britain, Feb. 26, 1970, 9,261/70

Int. Cl. A47f *3/04*

U.S. Cl. 312—138 A **1 Claim**

A refrigerator door liner has a mounting for a removable shelf in which the door liner has a projecting horizontal shelf support, a pair of opposite vertical flanges and a pair of ledges

respectively formed on said vertical flanges. A detachable stirrup interfits with said ledges and is adapted to embrace a shelf



resting on the horizontal support, the detachable stirrup engaging formations on the door liner when interfitting with the ledges.

3,709,577

DESKS

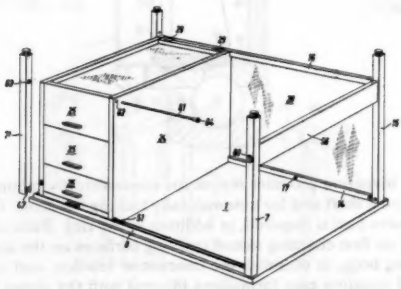
Frank Rutherford; Ivor Gerald Arenson; Alan George Cracknell; William Henry Foulds, and Albert T. Derrick, all of St. Albans, England, assignors to A. Arenson Limited, St. Albans, England

Continuation-in-part of Ser. No. 814,738, April 9, 1969. This application Oct. 21, 1970, Ser. No. 82,622

Claims priority, application Great Britain, April 23, 1968, 19,245/68

Int. Cl. A47b *47/00, 17/00, 19/00*

U.S. Cl. 312—263 **2 Claims**



A desk adapted to be transported and stored in "knocked down" form, such desk comprising a top member providing a working surface, front and rear frames for supporting the top member, and at least one pedestal providing storage space, the pedestal being attached to the frames but not to the top member.

3,709,578

MODULAR STORAGE AND DISPLAY ASSEMBLY

Vittorio Introini, Via Ivrea 1, Gallarate, Varese, Italy

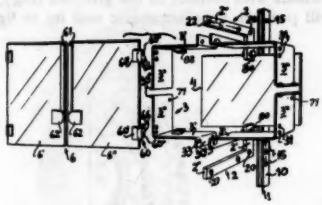
Filed Sept. 23, 1970, Ser. No. 74,797

Claims priority, application Italy, Mar. 23, 1970, 83622A/70

Int. Cl. A47b *47/00*

U.S. Cl. 312—245 **9 Claims**

A modular storage and display assembly comprises an upright support channel defining a gap and formed with a succession of equispaced transversely throughgoing bores. A right-angle bracket is receivable in the gap and clampable in place by hand screws. One or two W-shaped shelf elements can be secured to the bracket, with another bracket and shelf element or elements forming an upwardly closed storage cell. A thin brace extending from the support channel, which is



formed by a pair of bars, can be attached by a hand screw to the support above the bracket and to the end of the shelf remote from the support if an upwardly open shelf is wanted.

3,709,579

OPTICAL SYSTEM FOR FOCUSING SPACED OBJECT PLANES IN A COMMON IMAGE PLANE

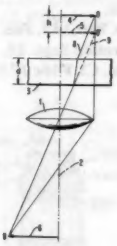
Gunter Makosch, 7034 Maichingen, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed March 18, 1971, Ser. No. 125,570

Claims priority, application Germany, March 19, 1970, P 20 13 101.5

Int. Cl. G02b *21/18*

U.S. Cl. 350—30 **24 Claims**



An optical system for focusing spaced object planes into a common image plane by means of a compensating optical element alternately placed and removed from between an objective and the object planes which equalizes the optical paths thereof.

3,709,580

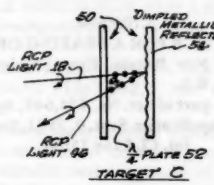
EXTENDED RANGE POLARIZATION TARGET

Ronald B. Fugitt, San Diego, and Paul J. Heckman, Jr., Rancho Santa Fe, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed March 18, 1971, Ser. No. 125,665

Int. Cl. G02b *5/30*

U.S. Cl. 350—157 **2 Claims**



A reflector, particularly useful for underwater use, comprising a base material having angled surfaces for retro-reflecting

an incident beam of light back substantially parallel to the incident beam, and means for polarizing the reflected beam into the same circular polarization handedness as the incident beam.

3,709,581

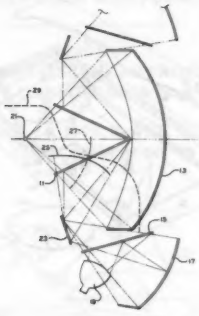
WIDE ANGLE INFINITY IMAGE VISUAL DISPLAY

Frank W. McGlasson, Windsor, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Feb. 5, 1971, Ser. No. 112,924. The portion of the term of this patent subsequent to May 2, 1989, has been disclaimed.

Int. Cl. G02b *17/06, 27/14*

U.S. Cl. 350—174 **9 Claims**



An improved wide angle visual display made up of a plurality of narrow angle reflective mirror-beamsplitter displays shaped as spherical segments. By using a second reflective mirror-beamsplitter combination with each narrow angle display to provide an aerial image input, the field of view of each narrow angle display is increased and thus fewer narror angle displays are required to make a wide angle display of a given size.

3,709,582

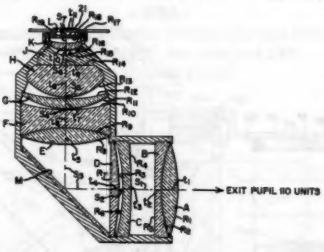
HIGH PERFORMANCE FOLDED OBJECTIVE LENS

Bruce H. Walker, Carlisle, Mass., assignor to General Electric Company

Division of Ser. No. 878,137, Nov. 19, 1969, Pat. No. 3,622,786. This application May 21, 1971, Ser. No. 145,614

Int. Cl. G02b *9/64, 27/14*

U.S. Cl. 350—202 **2 Claims**



A high performance folded objective lens and a compact fluoroscopic apparatus incorporating the lens are disclosed. The objective lens has a relative aperture of *f*/1.0 and its performance has been optimized for use with an X-ray image intensifier tube. The lens consists of two spaced groups with a fold of 90° introduced between the two groups. The first group, which consists of four elements, is of relatively low power. The second group which consists of six elements is of relatively high power, designed particularly to have a short physical length. Provision has been made for make-up glass in the back focal region. The fluoroscopic apparatus, of which the lens is a part, achieves compactness measured along the axis of the X-ray beam by folding the optical axis. In a preferred application, this feature permits location of the fluoroscopic apparatus in the limited vertical dimensions available beneath an examination table without reduction in the efficiency of optical coupling to the conventional multiple output devices.

3,709,583

COVERING DEVICE FOR SKYLIGHTS

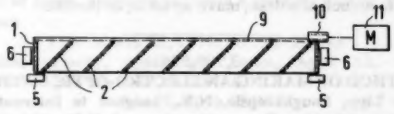
Heinrich Pfannkuch, Berrschestrasse 16; Adolf Saxberger, Nassistrasse 21, both of Munich, and Fritz Schnebel, 8201 Greimelberg 75a, Greimelberg, all of Germany

Filed Feb. 19, 1971, Ser. No. 116,853

Claims priority, application Germany, Feb. 27, 1970, P 20 09 372.5

Int. Cl. G02b *27/00*

U.S. Cl. 350—260 **13 Claims**



A covering device for a skylight in a flat roof including a frame mounted in the skylight opening and having horizontally disposed reflector panels that are inclined relative to the roof. The frame is rotatable and can be tilted or the panels can be tilted to follow the relative movement of the sun.

3,709,584

LIGHT BLOCKING ARRANGEMENT

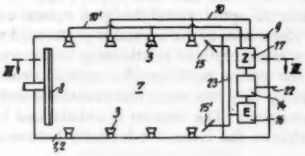
Frank Frungel, Hamburg, Germany, assignor to Impulsphysik GmbH, Hamburg, Germany

Filed Dec. 11, 1969, Ser. No. 884,177

Claims priority, application Germany, Dec. 18, 1968, P 18 15 249.3

Int. Cl. G02f *1/30*

U.S. Cl. 350—266 **14 Claims**



A chamber with two normally transparent walls is arranged in the path of light. Injectors mounted on the wall of the chamber inject carbon to cover the transparent walls upon receipt of electromagnetic and light signals signifying a nuclear detonation.

3,709,585

COMB AND PIN MIRROR

Chern H. Tsai, 41-46 Case Street, Elmhurst, N.Y.

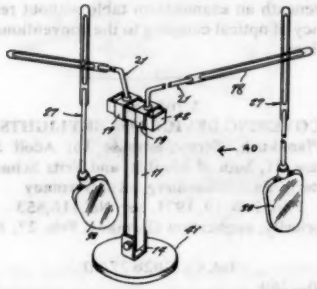
Filed Feb. 23, 1971, Ser. No. 118,143

Int. Cl. G02b *5/08*

U.S. Cl. 350—305 **4 Claims**

A beauty aid mirror assembly which frees a person's hands from holding individual mirrors to view all sides of a head while combing or pinning the hair, the assembly consisting of a set of two individual mirrors each of which is rotatable 360°

and tiltable 90° by means of a pair of swivel joints supported by a slide slidable along a channelled extension arm which at its one end is attached pivotally to a bracket mountable either



to a vertical supporting surface such as a wall or chest drawer, or which can be supported from a base placed upon a horizontal surface such as a desk, make up table, or the like.

3,709,586

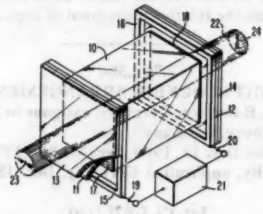
METHOD OF MAKING AN ELECTRO-OPTIC SWITCH

James Lipp, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 2, 1970, Ser. No. 86,209

Int. Cl. G02f *1/26*

U.S. Cl. 350—320 **8 Claims**



A method of fabricating electro-optic switches for use in high speed applications. Transparent conductive electrodes are affixed to a substrate and then directly applied to the surfaces of an electro-optic crystal using an optical cement. Affixing of the electrodes to the crystal is performed while pressure, having a predetermined relationship to the crystal size, is exerted on the entire package. An optical cement is also described having very low electrical resistance and very high optical transmissivity. The cement is unbalanced by an ionic carrier to enhance the ionic conductivity between the electrodes.

3,709,587

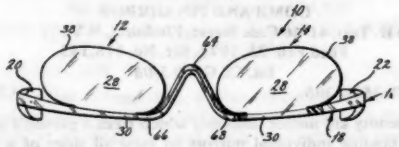
EYEGLASSES HAVING READILY REMOVABLE LENSES

Mary Irene Wick, 7533 Parkdale Drive, Clayton, Mo.

Filed March 10, 1971, Ser. No. 122,839

Int. Cl. G02c *1/02*

U.S. Cl. 351—106 **14 Claims**



Eyeglasses having a lens carrier and lens means detachably secured to the lens carrier. The lens means and lens carrier are provided with engaging means of complementary configuration to permit interchangeability of lenses of varying sizes and shapes with lens carriers of diverse style and ornamentation.

3,709,588

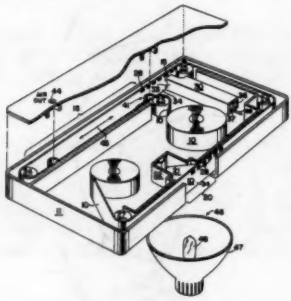
MOTION PICTURE SYSTEM WITH UNIQUE PROJECTOR AND METHOD

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 755,901, Aug. 28, 1968, Pat. No. 3,615,127. This application May 24, 1971, Ser. No. 146,025

Int. Cl. G03b *23/02*

U.S. Cl. 352—78 R **11 Claims**



A motion picture system and method including a unique compact multipurpose film handling cassette-projector arrangement. The cassette is initially furnished with unexposed film and includes an arrangement for exposing, processing, drying and projecting that film in cooperation with externally mounted features of a camera and projector. After the film has been exposed with the cassette mounted in the camera, it is mounted in the projector which has cooperating features for effecting the processing, drying and projection of the film strip.

3,709,589

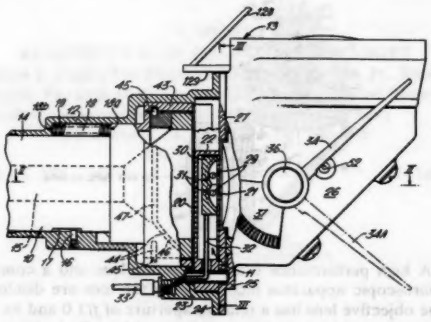
HEAD-UP DISPLAY APPARATUS

Edward Lawrence Lamb, Ashford; Kenneth Gordon McAinsh, Camberley, and Ralph David Smith, Walton, all of England, assignors to Smiths Industries Limited, London, England

Filed Dec. 28, 1970, Ser. No. 101,774

Int. Cl. G03b *21/00*

U.S. Cl. 353—13 **11 Claims**



Head-up display apparatus that includes a collimator for projecting a display on to a partially-transparent reflector, also includes first and second display-producing means for providing respectively main and auxiliary displays of information, and means for selecting which of the displays is projected on to the reflector. Selection of which of the two display-produc-

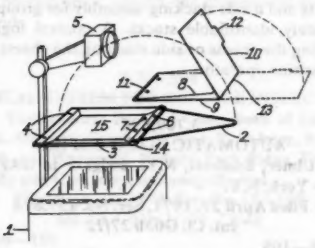
ing means acts as the source of the projected display is effected by a handle that is movable between first and second positions to control rotation of a sleeve that is coupled to both display-producing means. Movement of the handle in one direction moves the first display-producing means longitudinally away from the collimator means so as to provide a space between this display-producing means and the collimator means, and also pivots the second display-producing means into the said space along an arcuate path substantially normal to the direction of movement of the first display-producing means. The first display-producing means is a cathode-ray tube, and the second display-producing means, for use in the event that the cathode-ray-tube display fails, is an illuminated graticule or a device in which an incandescent filament is strung into a desired display-pattern.

3,709,590

FOLDER FOR OVERHEAD PROJECTOR

Aaron M. Bisberg, P.O. Box 14 North Station, White Plains, N.Y.

Filed Sept. 14, 1970, Ser. No. 72,064
Int. Cl. G03b *21/00*
U.S. Cl. 353—120 **5 Claims**



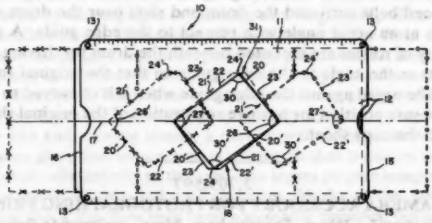
A three leaf folder for use on an overhead projector, with each leaf consecutively hinged. Two leaves of the folder are constructed with an indexing system for positioning the folder on a coupling member that predetermines the proper relationship between the projector and transparencies to be viewed and one transparency to another. While projection and manipulation occur, the third leaf provides an exposed surface upon which instructional material is provided.

3,709,591

VARIABLE PHOTOGRAPHIC MASK FOR MAINTAINING MULTIPLE CONSTANT PROPORTIONS OF A VISIBLE AREA

Walter Alzmann, 7850 Rudnick Avenue, Canoga Park, Calif.

Filed July 26, 1971, Ser. No. 165,898
Int. Cl. G03b *27/28*
U.S. Cl. 355—126 **2 Claims**



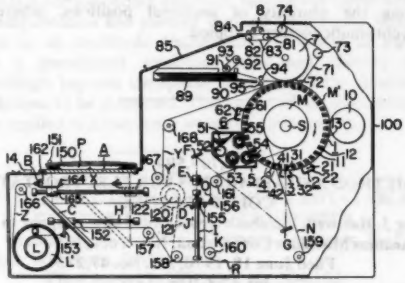
A mask for demarcating a selected portion of a photograph according to constant proportions of an aperture of the mask for use in making reproductions or projections, usually enlargements, of the selected portion. The mask includes a sheath which guides a slide through two opposite open ends of the sheath. A substantially rectangular aperture passes through the sheath and slide. Two diagonally opposite corners of the aperture are located on coincident centerlines of the sheath and slide and two aperture sides forming one of the corners are of a different proportion then the opposing two aperture sides forming the other corner. The slide aperture so formed is rotated 180° within the sheath to locate identically proportioned sides of the sheath and slide opposite each other on the coincident centerlines. In operation, the aperture is placed over the selected portion of a photograph and the particular proportion of the selected area is chosen by adjusting the area of the aperture by adjusting the position of the slide. The desired size is marked on the photograph by outlining the aperture. If the other proportion is desired instead, then the slide is adjusted in the opposite direction to adjust the area of the aperture.

3,709,592

COPYING MACHINE

Kazuo Kawakubo, Kawasaki, and Akira Kurahashi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed March 25, 1970, Ser. No. 22,443
Claims priority, application Japan, April 12, 1969, 44/28558; April 12, 1969, 44/33414
Int. Cl. G03b *27/70*
U.S. Cl. 355—8 **12 Claims**



A copying machine of a through-slit-exposure type using a movable scanning mirror, a fixed table for placing an original to be copied and a fixed objective lens. The light source is movable and first and second mirrors are moved in orthogonal relationship and the velocities of the movements of these elements are predetermined. The mirrors are moved with the aid of belt means which is simple structure and ready to manufacture.

3,709,593

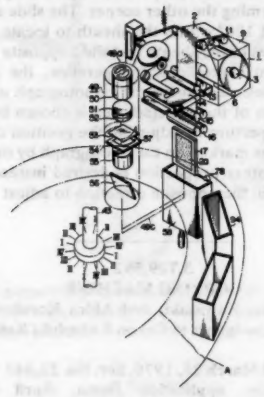
ELECTROSTATIC COPYING APPARATUS FOR POLYCHROMATIC PICTURE

Yushi Matsumoto, Ohta-ku, Tokyo; Tunahiro Ozawa, Kamakura-shi, Kanagawa; Tadashi Ochiai, Totsuka-ku, Yokohama, and Masaomi Sakai, Kohoku-ku, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed July 6, 1971, Ser. No. 160,029
Claims priority, application Japan, July 7, 1970, 45/58964
Int. Cl. G03g *15/00*
U.S. Cl. 355—4 **8 Claims**

Apparatus wherein a polychromatic original picture to be copied, an exposure mask for holding a piece of sensitive paper, and an optical system for projecting monochromatic optical images of the polychromatic original picture over the charged sensitive paper are made integral to construct a projection system, the projection system is rotated intermittently

and relatively with respect at least to a developing device for an electrostatic image and a fixing device for a developed visible picture, a plurality of sectional positions are formed around the central line of the relative rotation, and monochromatic pictures of colors different from one another are formed on the light-sensitive member at the respectively selected ones among the plurality of sectional positions, whereby a polychromatic picture is copied.



3,709,594

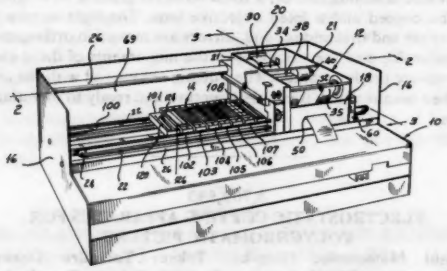
METHOD AND APPARATUS FOR ELECTROSTATIC COLOR PRINTING

Peter J. Hastwell, Elizabeth Grove, Australia, assignor to Savin Business Machines Corporation, New York, N.Y.

Filed June 18, 1970, Ser. No. 47,273

Int. Cl. G03g *15/00*

U.S. Cl. 355—4 **29 Claims**



A process of and apparatus for rapidly producing a multicolor print from a multicolor original such as a transparency in which there are carried out successive cycles of operations each of which cycles comprises electrostatically charging a photoconductive surface, exposing the surface to a particular color radiation pattern derived from the original, wetting the surface with clear resistive liquid, and thereafter applying a developing agent to the surface for the particular color being developed during that cycle. The apparatus produces the multicolored copy automatically, and, with but minor changes in the apparatus, the sequence of colors to be developed can be readily changed for successive sequences.

3,709,595

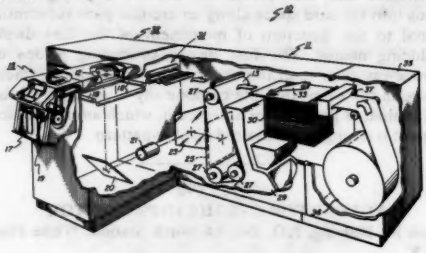
PRINTER SYSTEM

Lyman H. Turner, Pittsford; William P. Kukucka, Henrietta, and James E. Summers, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 9, 1970, Ser. No. 70,863

Int. Cl. G03g *15/00*

U.S. Cl. 355—14 **5 Claims**



A copier/duplicating system producing finished sets of copies from documents fed and copied in repeated cycles including a stapling assembly for collecting and stapling copy sheets into booklets and a side stacking assembly for grouping sheets into separately identifiable stacks. A control logic enables either stapling the sheets or side stacking the sheets at the option of a machine operator.

3,709,596

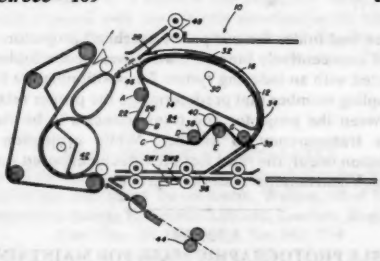
AUTOMATIC DIAZO COPIER

Arnold G. Ulmer, Endicott, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed April 27, 1971, Ser. No. 137,874

Int. Cl. G03b *27/12*

U.S. Cl. 355—109 **3 Claims**



A recirculating arrangement for conveying an original sheet after initial registration with a copy sheet and duplication thereof back to an exposure position for registration with another copy sheet and duplication thereof. The recirculating arrangement comprises a stationary vacuum drum having a curved surface with an edge guide thereon. A plurality of spaced belts surround the drum and slide over the drum surface at an acute angle with respect to the edge guide. A plurality of rollers are mounted beneath the drum for driving the belts at the angle to the edge guide so that the original sheet will be urged against the edge guide when it is conveyed to the exposure position for positive registration of the original sheet with the copy sheet.

3,709,597

CAMERA ACCESSORY FOR PHOTOGRAPHING PRINT

Salvatore La Rocca, Framingham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

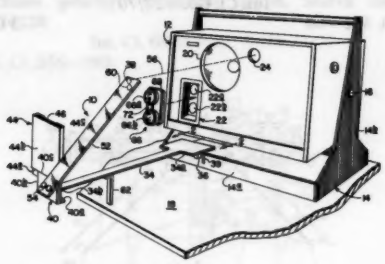
Filed April 26, 1971, Ser. No. 137,151

Int. Cl. G03b *27/62*

U.S. Cl. 355—61 **29 Claims**

An accessory device for releasable attachment to the camera unit of an established identification system to permit

the use of a photograph of a person instead of the actual person as the photographic subject for reproduction on an identification card. The device basically comprises lens means supplementary to the camera lens; target means cooperating with an aiming light of the camera, and structure associated



with an elongated support member for positioning the photograph in front of the camera. The device is adapted to rapid installation or removal so that either the aforementioned photograph or an actual person in the conventional system may constitute the photographic subject, the changeover involving but a few seconds.

3,709,598

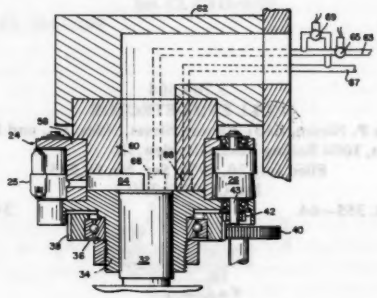
OPTICAL SYSTEM FOR CAPSULE INSPECTION

Willard J. Vandenberg; Hi Chul Chae, both of Indianapolis; Elmer R. Stewart, Camby; Wayne R. Palmer, Mooresville, all of Ind., and Howard R. Padgitt, Park Ridge, Ill., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sept. 23, 1971, Ser. No. 183,199

Int. Cl. G01n *21/22, 21/48*

U.S. Cl. 356—198 **51 Claims**



Medicinal-capsule inspection apparatus. Successive capsules spun on their axis in an inspection position are illuminated by intense light originating at a single lamp filament and reflected onto the capsule from a mirror in the form of a narrow band cut from an ellipsoid and positioned so that the filament is adjacent to one focus and the capsule adjacent to the other focus. The mirror wraps around the capsule endwise and produces on the capsule, as seen by a side-viewing lens and two end-viewing lenses, a narrow well-defined and continuous glare line area which is unique in that it curves over the ends substantially to the axis. The lenses project images of the capsule in side and end elevation. Masks at the image planes block the glare light from acceptable capsules, but contain apertures in selected relation to the image glare light areas, which pass light specularly reflected from defects in selected observation areas on the spinning capsules. Such light acts on light sensors behind the apertures to generate electrical control signals which provide inspection output information.

3,709,599

LASER DOPPLER FLOW PROBE WITH HIGH SPATIAL RESOLUTION

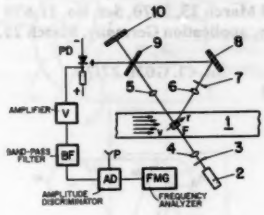
Paul D. Iten, Luzern, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Nov. 10, 1970, Ser. No. 88,399

Claims priority, application Switzerland, Nov. 21, 1969, 17346/69

Int. Cl. G01p *5/00*

U.S. Cl. 356—28 **3 Claims**



An arrangement for microscopic measurement of velocities in a flow field comprises a laser beam of a predetermined frequency which is focussed on a selected volume of the fluid flowing in a field to produce an unscattered as well as a scattered component beam. The two component beams are directed onto a photodetector which mixes them and produces a corresponding electrical heterodyne signal which, after amplification and passage through a band-pass filter, is applied to an amplitude discriminator to delete all signals below a preselected amplitude level and thereby correspondingly improve the spatial resolution of the volume of fluid desired to be measured. The output of the discriminator is then applied to a frequency measuring instrument.

3,709,600

DEVICE FOR GAS ANALYSIS WITH A ROTATABLE CYLINDRICALLY SHAPED CHOPPER

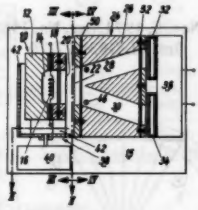
Peter Ganshorn, Wuerzburg, Germany, assignor to Erich Jaeger, Wurzburg, Germany

Filed April 19, 1971, Ser. No. 134,103

Claims priority, application Germany, April 17, 1970, P 20 18 539.1

Int. Cl. G01n *21/34, 21/24*; G02b *17/00*

U.S. Cl. 356—51 **4 Claims**



A device for gas analysis by measurement of absorption of electromagnetic, especially optic, radiation comprises a radiation source emitting a beam of electromagnetic radiation which is splitted by a beam splitter into a sensing beam and a reference beam passing through a sensing chamber and a reference chamber, respectively to radiation sensitive means responding to the difference in intensity of the sensing and reference rays and providing a corresponding electric output signal. A rotary shutter is arranged between the radiation source and the beam splitter to chop up the emitted beam before it enters into the beam splitter. The rotary shutter or chopper comprises preferably strip-shaped elements which form parts of a cylinder, the elements having edges parallel to

the axis of the cylinder and rotating around the axis of the cylinder in a circular path which includes or encompasses the radiation source.

3,709,601

METHOD AND APPARATUS FOR THE PRODUCTION OF COLOR PRINTS

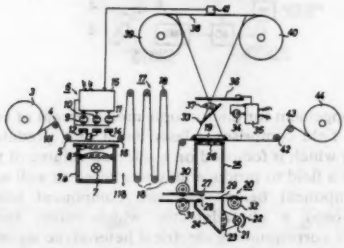
Wolfgang Zahn, Munich; Gunter Findeis, Unterhaching, and Dieter Muller, Leverkusen, all of Germany, assignors to AGFA Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed March 23, 1970, Ser. No. 21,670

Claims priority, application Germany, March 21, 1969, P 19 14 360.3

Int. Cl. G03b 27/78

U.S. Cl. 355—38 8 Claims



Images of color transparencies on strips of exposed photographic film which are joined end-to-end to form an elongated web are reproduced onto successive portions of a roll of photosensitive material by exposure to printing light wherein the ratio of primary colors corresponds to the average ratio of primary colors in all transparencies of an entire strip. Such ratio is determined at a scanning station which is located ahead of the printing station, and successive transparencies of each strip are caused to enter a magazine between the two stations prior to exposure of transparencies in the respective strip to printing light.

3,709,602

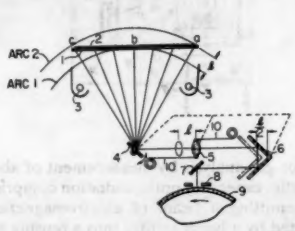
OPTICAL PATH LENGTH COMPENSATION IN A COPIER

Toyokazu Satomi, Tokyo, Japan, assignor to Ricoh Co. Ltd., Tokyo, Japan

Filed Nov. 5, 1971, Ser. No. 196,014

Int. Cl. G03b 27/70

U.S. Cl. 355—49 10 Claims



An original placed on a transparent flat base is scanned by a rotary reflection mirror which directs light via a focusing lens and a second reflection mirror onto a photosensitive material. The difference in light path length caused by rotational scanning of the flat original is compensated for by moving the second reflection mirror and, in some embodiments, by movement also of the focusing lens or a zoom lens.

3,709,603

ELECTROPHOTOGRAPHIC COPYING MACHINE

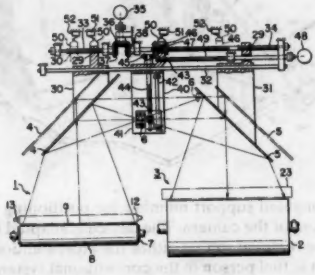
Masayoshi Furuichi, Tokyo, Japan, assignor to Katsuragawa Denki Kabushiki Kaisha, Tokyo-to, Japan

Filed Nov. 4, 1970, Ser. No. 86,773

Claims priority, application Japan, Nov. 7, 1969, 44/105957

Int. Cl. G03b 27/70

U.S. Cl. 355—60 3 Claims



In an electrophotographic copying machine wherein the light image of an original is projected upon a photosensitive element carried by a rotary drum through a pair of confronting relative mirrors and a focusing lens located between these two reflective mirrors, the mirrors are moved in the horizontal direction toward and away each other, and the lens is moved in the vertical direction over the same distance as the reflective mirrors concurrently therewith. Further, the lens is moved in the horizontal direction whereby to vary the magnifying power.

3,709,604

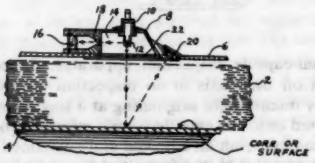
ROLL END DETECTOR

George P. Niesen, 8131 Elmore Street, Niles, Ill., and Moo S. Yoon, 1004 Rolling Ross, Glenview, Ill.

Filed July 20, 1970, Ser. No. 56,585

Int. Cl. G03l 27/52

U.S. Cl. 355—64 3 Claims



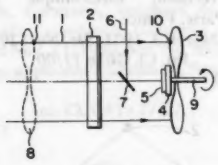
In order to determine when a roll of web material, such as paper, wound on a core has reached its end, a photoelectric detecting circuit is provided. The photoelectric apparatus is shown in combination with an electrostatic copying machine and includes a pair of photocells in a bridge circuit. One photocell receives light directly from a source while the other receives light reflected from the surface of a roll of web material. When the web material has been unwound to expose a core of a different color, the intensity of the reflected light changes causing the bridge circuit to become unbalanced, which unbalance is amplified and utilized to operate control means.

3,709,605

HOLOGRAPHIC INTERFEROMETRY FOR ROTATING OBJECTS

Tadao Tsuruta, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed March 22, 1971, Ser. No. 126,613
Claims priority, application Japan, March 28, 1970, 45/26228
Int. Cl. G01b 9/02; G02b 27/00
U.S. Cl. 356—109 4 Claims



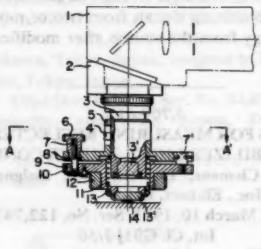
A holography device incorporating an optical system including a semireflecting mirror disposed vertically with respect to the axis of the rotary shaft of a rotating object for producing a double-exposure hologram of the rotating object at different speeds of rotation, thereby enabling the interference measurement of a variation occurring in the configuration of the rotating object with the variation in its speed of rotation.

3,709,606

DEVICE FOR ADJUSTING ANGLE OF INCLINATION OF REFERENCE MIRROR FOR INTERFEROMETER

Jinichi Kato, and Toshiharu Shimizu, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 26, 1970, Ser. No. 67,070
Claims priority, application Japan, Aug. 30, 1969, 44/81897
Int. Cl. G01b 9/02
U.S. Cl. 356—109 5 Claims



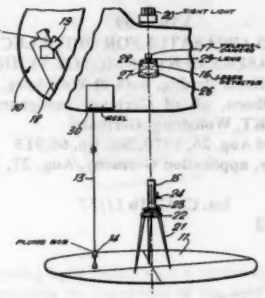
A device for adjusting the angle of inclination of an interferometer reference mirror having a mirror holding member connected to a support member which is adapted to be slideably connected to an objective lens tube. The angle of inclination of the mirror holding member with relation to the support member and the objective lens is adjusted by adjusting members connecting the mirror holding and support members. The device is made slidable relative to the objective lens, so that the adjustment of the spacing and the direction of the interference fringes is carried out without damaging the specimen and the reference mirror. The replacement of the reference mirror and the objective lens may be made easily. The adjustment of the holding member for obtaining the interference fringes by multi-beam interference may be accomplished easily. Further, the device may be applied not only to multi-beam interferometers but also to the objective lens part of a microscopes.

3,709,607

AERIAL SURVEY

Frederick C. McConnell, 2003 Briar Crescent; George Jason, 108 Brown Crescent, and Neil J. Armstrong, 5428 Bannerman Drive, all of Calgary, Alberta, Canada

Continuation of Ser. No. 817,448, April 18, 1969, abandoned. This application Aug. 19, 1970, Ser. No. 65,259
Int. Cl. G01b 11/26
U.S. Cl. 356—152 10 Claims



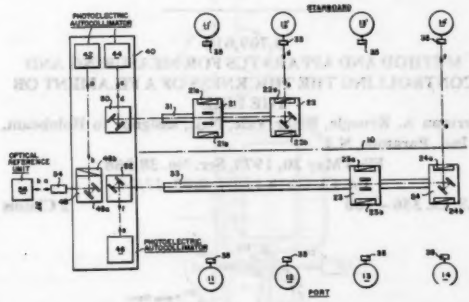
The invention provides a target positioning apparatus adapted to aid in the survey location of a predetermined point therebeneath. The apparatus includes a helicopter plus means on the helicopter enabling the pilot to view the terrain beneath it, and a laser alignment and device capable of indicating when the helicopter is positioned vertically over the point whose location it is desired to fix by survey. The laser alignment device includes a laser capable of projecting a laser beam directed vertically between the helicopter and the survey point. An image of the laser beam superimposed on an image of the terrain is displayed in the cockpit of the helicopter.

3,709,608

ANGULAR ALIGNMENT ERROR MEASURING SYSTEM

William J. Degnan, and Richard W. Samsel, both of Pittsfield, Mass., assignors to the United States of America as represented by the Secretary of the Navy

Filed March 19, 1971, Ser. No. 126,214
Int. Cl. G01b 11/26
U.S. Cl. 356—152 6 Claims



Collimated light is directed to a mirror mounted on a missile gimbal system and to a mirror mounted on a navigation optical reference. Any angular deviation from the ideal missile alignment results in light reflected from the mirrors non-parallel to the directed light. The angular variation is detected by a sensor in the collimator and the light beam is deviated by a wedge drive unit until the light is normal to the reflector. An electrical signal is generated proportional to the light beam angular compensation, to realign the missile. This invention is an improvement to the previously used angular alignment system; the improvement comprising fixed azimuth error indicator sta-

tion assemblies, one station assembly mounted between each pair of missiles in a longitudinal or series array of missiles within the submarine. Each station assembly has a pair of reflectors assembled as a pentamirror, directing the collimated light to either the port or starboard missiles, or the pentamirror can be arranged to pass the light through to the next successive station, and each station assembly has a pair of wedge drive assemblies to deviate the light and measure the missile bearing misalignment angle of the port and starboard missiles.

3,709,609

METHOD AND APPARATUS FOR OPTOELECTRONIC AXLE MEASUREMENT OF MOTOR VEHICLES

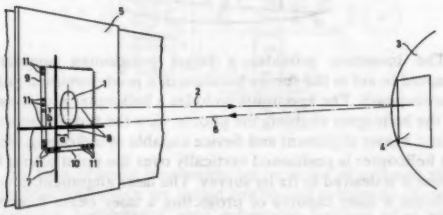
Erich Spengler; Horst Boning, both of Wolfsburg, and Heiko Requardt, Gifhorn, all of Germany, assignors to Volkswagenwerk AKT, Wolfsburg, Germany

Filed Aug. 26, 1970, Ser. No. 66,913

Claims priority, application Germany, Aug. 27, 1969, P 19 43 465.2

Int. Cl. G01b *11/27*

U.S. Cl. 356—152 **5 Claims**



A method and apparatus for the measurement of camber and toe-in of motor vehicles by reflecting a cross-hair pattern from a screen mounted to the vehicle wheel onto a viewing screen so that the cross-hair pattern intersects an orthogonal set of sensors mounted to the viewing screen. A digital read-out of the displacement of the cross-hair pattern from a reference position designates camber and toe-in on a respective axis of the sensors. A continuity of the read-out is assured by ensuring that the width of the cross-hair pattern on the viewing screen overlaps two adjacent sensors and logic circuitry establishes a nonambiguous read-out by selecting the signal from the more remote sensor.

3,709,610

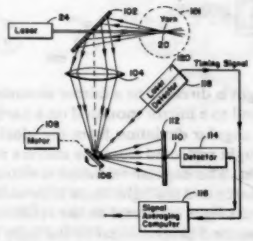
METHOD AND APPARATUS FOR MEASURING AND CONTROLLING THE THICKNESS OF A FILAMENT OR THE LIKE

Herman A. Kruegle, River Vale, N.J., assignor to Holobeam, Inc., Paramus, N.J.

Filed May 20, 1970, Ser. No. 38,968

Int. Cl. G01b *11/04, 9/02, 11/24*

U.S. Cl. 356—160 **2 Claims**



A light beam, such as that obtained from a laser, is irradiated onto a fine filament of wire, yarn or the like to produce a diffraction pattern. The spacing between the light and dark portions of the diffraction pattern is measured to provide an indication of the diameter of the filament. Several means for measuring the diffraction pattern spacing are disclosed. Also disclosed is a method of utilizing an interference pattern produced by irradiating a sharp edge with a light beam, thereby to evaluate the edge sharpness.

3,709,611

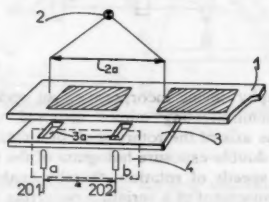
APPARATUS FOR DERIVING ELECTRICAL SIGNALS

Jean Taisne, Fontenay sous Bois, France, assignor to Societe D'Optique Precision, Electronique Et Mecanique (SOPELEM), Paris, France

Filed March 3, 1971, Ser. No. 120,554

Int. Cl. G01b *11/00*

U.S. Cl. 356—170 **6 Claims**



An apparatus for providing electrical signals representative of relative movement between two members includes a source of radiant energy conveniently light. A movement sensor fixed to one of the movable members comprises at least one detector responsive to energy from the source. A graduated track fixed to the other movable member is composed of a regular alternating series of marks and spaces capable of varying differently the energy from the source which is received by the detector by way of the track. Thus each detector provides a periodic undulating signal as the two members move relatively to one another. The or each signal is transformed by a reshaping device in which it is compared with a reference signal derived from at least one other detector exposed to energy from the source to derive a rectangular signal varying between one and the other of two logic levels. The reference signal may be derived by combining signals from two or more detectors exposed to energy from the source after modification by the track.

3,709,612

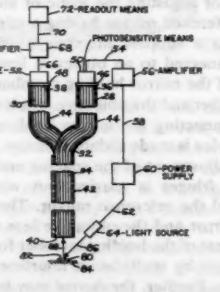
APPARATUS FOR MEASURING REFLECTED LIGHT UNDER STABILIZED LIGHT SOURCE CONDITIONS

Anton Hubert Clemens, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed March 10, 1971, Ser. No. 122,747

Int. Cl. G01j *3/50*

U.S. Cl. 356—178 **1 Claim**



Apparatus is described for simultaneously detecting light reflected from a color reflectance surface at two different

wavelength ranges wherein the reflected light detected at one wavelength range is employed to stabilize the light output of the light source directed at such reflectance surface and the reflected light detected at another wavelength range is employed to measure specific characteristics of the reflectance surface.

3,709,613

METHOD AND APPARATUS FOR DETERMINING PRINTING TIME OF NEGATIVES

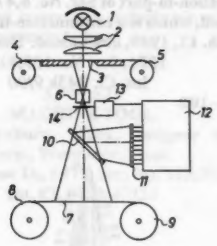
Wolfgang Zahn; Gunther Friedrich, and Volker Weinert, all of Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 13, 1970, Ser. No. 89,357

Claims priority, application Germany, Nov. 17, 1969, P 19 57 752.7

Int. Cl. G01n *21/22*

U.S. Cl. 356—202 15 Claims



The light transmitted through each negative is measured at N regions to obtain a transparency or density at each of these regions. The measured values are then compared with each other and, on the basis of this comparison, the negatives are grouped to obtain the correct printing time with density correction.

3,709,614

DETECTOR APPARATUS FOR PARTICULATE CONTAMINANTS IN A FLUID UTILIZING PARALLEL FLOW PATHS

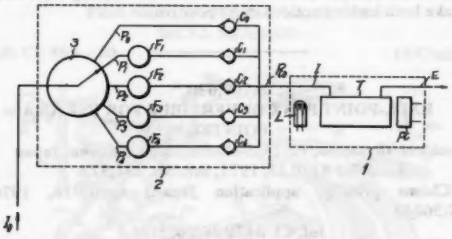
Osamu Hayakawa, Tokyo, Japan, assignor to Kabushikikaisha Tokyo Keiki, Tokyo, Japan

Filed Dec. 1, 1970, Ser. No. 94,077

Claims priority, application Japan, Dec. 13, 1969, 44/117997

Int. Cl. G01n *21/06, 21/26, 21/02*

U.S. Cl. 356—208 3 Claims



A detector apparatus for particulate contaminants in a fluid utilizing parallel flow paths to selectively guide the fluid being tested through one of such flow paths and into a detector means having means for producing a signal responsive to variations in the quantity of contaminants in the fluid and means for receiving the signal and converting it to indicia indicating the amount of a given particle size in the fluid. Each of the flow paths has a filter with a select mesh size therein.

3,709,615

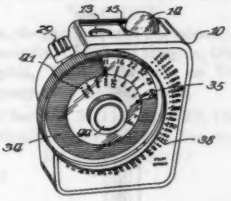
INTEGRATING LIGHT METER WITH MOVABLE METER MECHANISM

Thomas R. Blakeslee, Sherman Oaks, Calif., and Erwin Bryll, Deerfield, Ill., assignors to Calumet Photographic, Inc.

Filed Feb. 28, 1969, Ser. No. 803,169

Int. Cl. G01j *1/42, 1/46*

U.S. Cl. 356—224 8 Claims



An integrating light meter with a circuit which develops a signal representing the logarithm of the light being measured and utilizes a display having a linear f-number scale. The meter has two ranges, provided by physically moving the meter mechanism with relation to the scale indicia so that the range of movement of the pointer encompasses a different portion of the scale. The sensitivity of the meter is changed between ranges by a mask with an aperture therein which limits the light to the photocell.

3,709,616

MEASURING VESSEL FOR PHOTOMETRIC ANALYSIS OF A LIQUID, IN WHICH GAS BUBBLES ARE DEVELOPED

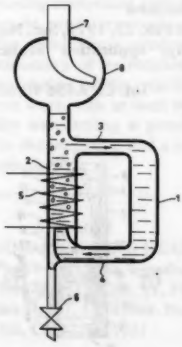
Per Hjalmar Jonsson, Safe, Sweden, assignor to Rederiaktiebolaget Nordstjernan, Stockholm, Sweden

Filed Jan. 27, 1971, Ser. No. 110,103

Claims priority, application Sweden, Jan. 30, 1970, 1209/70

Int. Cl. G01n *1/10*

U.S. Cl. 356—246 2 Claims



In the particular embodiments of the invention described in the specification, photometric examination of a liquid contained in a vessel is carried out while gas bubbles are developed or introduced into the portion of the vessel into which the photometric measurement is carried out. In one embodiment the bubbles are generated by heating the liquid and in another embodiment gas bubbles are generated by introducing a gas into the liquid through a gas inlet.

3,709,617

SUPPORT MEANS FOR OPTICAL SIGHTING INSTRUMENT

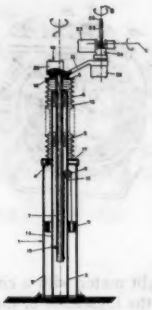
Vinicio Rascioni, and Giovanni Gianini, both of Rome, Italy, assignors to Contraves Italiana S.p.A., Rome, Italy

Filed Nov. 5, 1970, Ser. No. 87,041

Claims priority, application Italy, Nov. 7, 1969, 24065 A/69

Int. Cl. G01c *1/00*

U.S. Cl. 356—247 1 Claim



An optical aiming device comprises a sight mounted on a support so as to be adapted to perform movements in elevation and azimuth with respect to the support which is in turn movable vertically and rotatable horizontally about a fixed axis. The aiming device is based on the principle of bringing the sight on to the sighting line between the eye and the target instead of the principle used in known optical aiming devices of bringing the eye on to the sighting line between the sight of the aiming device and the target. Thus the operator, in order to aim at a moving target, need not move his body in order to bring his eye on to the sighting line between the sight of the aiming device and the target. He has just to follow the target with his eye and move the sight of the aiming device until it coincides with the sighting line between the eye and the target.

3,709,618

HOLDER FOR A STICK OF PASTY MATERIAL COMPRISING AN EJECTABLE STICK PROTECTING CAP

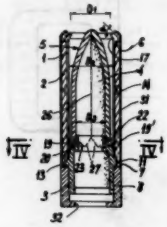
Georges Gruska, Paris, France, assignor to SEBEC Societe d'Exploitation de Brevets d'Emballage Cosmetique S.A., Fribourg, Switzerland

Filed Feb. 23, 1971, Ser. No. 117,963

Claims priority, application France, March 2, 1970, 7007341

Int. Cl. A45d *40/06*

U.S. Cl. 401—78 8 Claims



The present invention is related to a holder for a lipstick or for a similar product in the form of a stick which is protected by an ejectable transparent moulding cap.

The invention is more particularly related to such a holder which allows for the ejection of the protecting moulding cap under the effect of the first outward motion of the stick.

The holder according to the present invention is therefore characterized in that the stick outlet end of the holder is provided with at least one inner projection having an inner radius smaller than the inner radius of the tubular body of the inner sleeve; the protecting moulding cap has an outer radius slightly smaller than the inner radius of said inner projection, and its open end which is placed over the stick holding cup is provided with at least one outwardly extending projection having an outer radius slightly smaller than said inner radius of the inner sleeve body; furthermore, the protecting moulding cap is of a split construction constituted by at least two juxtaposed cap segments defined by at least two longitudinal slits.

3,709,619

WRITING IMPLEMENT WITH RETRACTABLE WRITING TIP ENCLOSURE

Nathan A. Zepell, 1359 Santa Teresita Drive, Santa Barbara, Calif.

Continuation-in-part of Ser. No. 8,475, Feb. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 798,322, Feb. 11, 1969, abandoned. This application May 3, 1971, Ser. No. 139,418

Int. Cl. B43k *9/00*

U.S. Cl. 401—108 26 Claims

A pen has an apertured sliding protector cap that slides away from the pen body over a stationary writing point to protect it for storage and retracts to expose the point for writing. A lock for the extended position is a swinging tongue engaging the pen body and releasable by pressing inwardly on the clip. A clip is connected to the tongue and acts as a lock for the retracted position by the ball of the clip fitting in a recess in the pen body; that is, by retracting the clip. A lengthwise sliding action of the clip is utilized to move the sliding cap and to make both locking actions more positive.

3,709,620

BALL-POINT PEN CONVERTIBLE FOR USE AS A POINTER

Naokichi Miyamoto, 12-23, 3-chome, Isobe, Annaka, Japan

Filed April 15, 1971, Ser. No. 134,323

Claims priority, application Japan, April 16, 1970, 45/36242

Int. Cl. B43k *29/00*, *5/16*

U.S. Cl. 401—195 10 Claims

A ball-point pen is disclosed which is convertible to a pointer and comprises telescoping connecting tubes which can be extended and retracted in stages from an outer tube. An operation button is mounted at the upper end of the outer tube for slidable movement between an outer extended position and an inner retracted position and the button removably carries a ball-point and ink cartridge assembly. A detachable head is secured to the lower end of the innermost telescoping

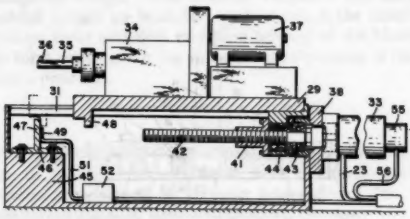
tube and the ball-point protrudes through an aperture in the head when the button is retracted. A resilient clip is attached

to the outer tube and operates a slidable pin which controls the position of the operation button.

3,709,621
MACHINE TOOL

John A. Wake, Auburn, Mass., assignor to Cincinnati Milacron-Heald Corp., Worcester, Mass.

Filed June 16, 1971, Ser. No. 153,702
Int. Cl. B23b *47/20*
U.S. Cl. 408—11 **5 Claims**

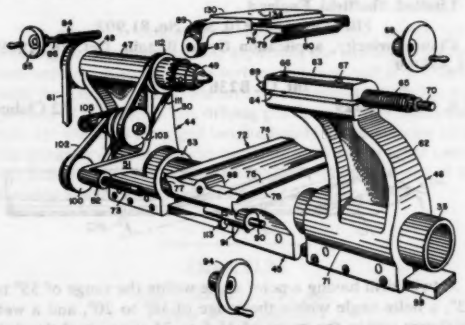


A machine tool having a table which is slidable on ways and which is driven by a torque motor; a stop is provided to terminate table movement, which stop is relatively flexible and is provided with a strain gage; a computer is used for controlling the torque on the motor and changing from one torque to another at various positions in table travel.

3,709,622
DRILL PRESS ATTACHMENT ASSEMBLY

Glenn B. Morse, 321 Fountain N.E., Grand Rapids, Mich.

Filed Nov. 12, 1970, Ser. No. 47,774
Int. Cl. B27c *9/00*
U.S. Cl. 408—20 **19 Claims**

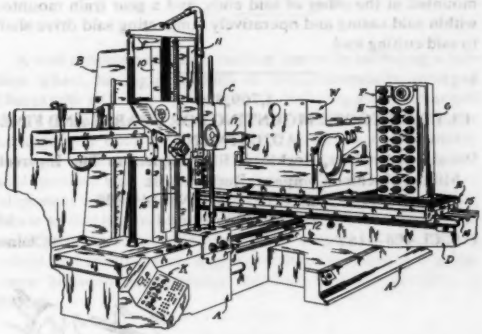


Lathe headstock and carriage members are mounted preferably on the column of a drill press, the headstock being driven by the power head of the drill press. The headstock and carriage are related in angular position about the axis of the column by a bar parallel to the column and fixed with respect to one of the members, and slideably engaging the other. The bar also stabilizes the sliding movement of the carriage against the forces of a feed screw displace laterally from the column.

3,709,623
COMBINED BORING, DRILLING AND MILLING MACHINE

Hallis N. Stephan, deceased, late of Cleveland, Ohio; Katharine S. Stephan, executrix, Cleveland Heights, Ohio, and Leslie C. Seager, Memphis, Tenn., assignors to The New Britain Machine Company, New Britain, Conn.

Continuation of Ser. No. 25,118, April 27, 1960, abandoned.
This application June 15, 1970, Ser. No. 46,401
Int. Cl. B23q *3/157*
U.S. Cl. 408—22 **23 Claims**



A machine tool having a vertically movable spindlehead provided with an extensible and retractable power-driven rotatable tool spindle including spring-biased mechanism for securing a tool member in the extensible end thereof releasable by a fluid pressure motor, a work-supporting compound slide assembly having two slide members movable in directions at right angles to one another in horizontal planes, all being selectively movable in opposite directions along their respective paths of movement, a tool magazine on the top slide of the work-supporting compound slide for holding a plurality of tool members in predetermined angular positions, means for stopping the spindle in a predetermined angular position upon discontinuation of its rotation and numerical control for affecting operation of the machine to perform a machining operation on work with at least two different tool members automatically transferring a previously used tool from the tool spindle to the magazine and a new tool from the magazine to the tool spindle.

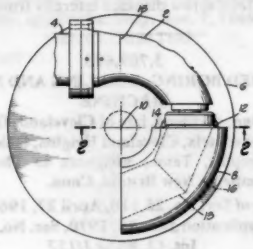
3,709,624
TORROIDAL BORING HEAD

Elmer D. Blank, 307 Parkwood Drive, Glendale, Calif.

Continuation of Ser. No. 782,818, Dec. 11, 1968, abandoned.
This application Dec. 7, 1970, Ser. No. 95,868
Int. Cl. B23b *29/03*
U.S. Cl. 408—127 **10 Claims**

A machine for accurately machining curved holes comprising a rotatable work supporting table having an axis of rotation and a plane of rotation; a segmented torroidal casing having two ends and support means fixedly mounting said casing in a plane parallel to said plane of rotation with the axis of said torroidal casing coinciding with said axis of rotation; a cutting tool rotatably mounted at an end of said casing and having a diameter larger than the diameter of said casing; drive means within said casing operatively connected to said cutting tool, and means to rotate said table about said axis of rotation.

A tool for accurately machining a curved hole comprising a segmented torroidal casing having two ends; a cutting tool having a diameter larger than that of said casing, said cutter



rotatably mounted at one of said ends; a drive shaft rotatably mounted at the other of said ends; and a gear train mounted within said casing and operatively connecting said drive shaft to said cutting tool.

3,709,625

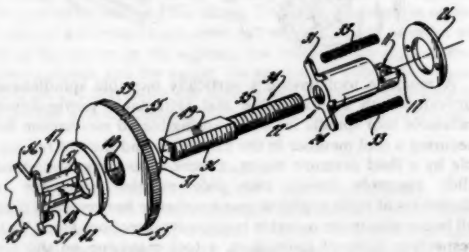
CUTTING TOOTH MOUNTING FOR COARSE AND FINE ADJUSTMENT

Donald S. Erkfritz, Rockford, Ill., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Filed June 4, 1971, Ser. No. 149,898

Int. Cl. B23b *29/034*

U.S. Cl. 408—181 **8 Claims**



This is an improvement over the cutting tooth mounting shown in Lemery et al. application Ser. No. 802,863 now abandoned in that the internal thread mating with the coarse thread of the differential screw is formed in a nut journaled in the cutter body and held against axial shifting.

3,709,626

DIGITAL ANALOG ELECTROHYDRAULIC TURBINE CONTROL SYSTEM

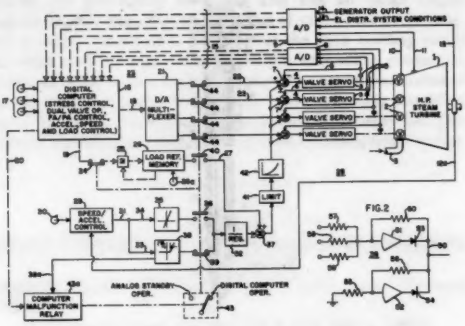
Markus A. Eggenberger, Schenectady, N.Y., assignor to General Electric Company

Filed Sept. 16, 1971, Ser. No. 180,999

Int. Cl. F01b *25/02*

U.S. Cl. 415—17 **5 Claims**

An electrohydraulic control system for a steam turbine has steam valve actuators with analog valve position set points or reference values supplied by a main control loop with a digital computer. The digital computer performs complex calculations to obtain the valve position set points in accordance with operating parameters of the steam turbine and desired operational modes. A standby analog control loop furnishes a simple speed and load control function in the event of loss of digital signals. When in digital computer mode, the analog speed loop provides a safety backup function through a "dead band" which provides valve closing signals upon excessive speed. In the analog or standby mode, a load reference signal representing the most recent load set point is supplied to the



analog control loop from a memory unit constantly updated by the digital computer.

3,709,627

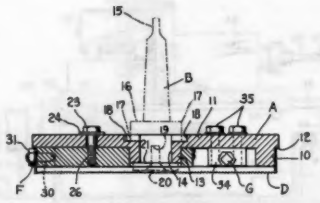
CUTTING TOOL

Olin S. Elliott, Jr., 2011 Cleveland Street, Greenville, S.C.

Filed June 30, 1971, Ser. No. 158,160

Int. Cl. B23b *41/02, 51/04*

U.S. Cl. 408—204 **5 Claims**



A tool adapted to be placed in a power driven rotated member, such as a chuck, for making curved cuts in material. The tool includes a circular flywheel which has a flexible elongated saw blade attached to the periphery thereof. A pivotal arm engages one end of the blade so that by adjusting a bolt which bears against the other end of the pivotal arm the blade can be drawn tightly around the periphery of the flywheel.

3,709,628

TWIST DRILLS

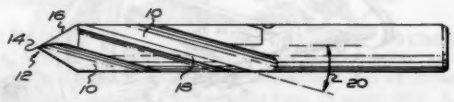
Charles Hibbert, Sheffield; Frederick Arthur Kirk, Moorgate; Keith Siddall, Gleadless, and Michael Roi Howard, Brentwood, all of England, assignors to Osborn-Mushet Tools Limited, Sheffield, England

Filed Oct. 19, 1970, Ser. No. 81,903

Claims priority, application Great Britain, Oct. 20, 1969, 51,368/69

Int. Cl. B23b *51/02*

U.S. Cl. 408—229 **12 Claims**



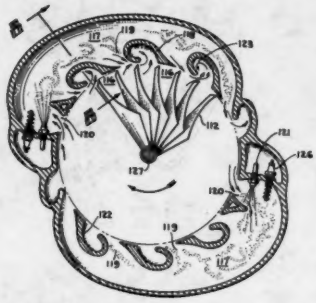
A twist drill having a point angle within the range of 55° to 73°, a helix angle within the range of 10° to 20°, and a web thickness within the range of 18.5 to 25 percent of the drill diameter.

3,709,629

INTEGRATED FLOW GAS TURBINE

Earl W. Traut, P.O. Box 23776, Fort Lauderdale, Fla.

Continuation-in-part of Ser. No. 741,623, July 1, 1968, abandoned. This application May 26, 1970, Ser. No. 40,633
Int. Cl. F01d 1/22
U.S. Cl. 415—56 6 Claims



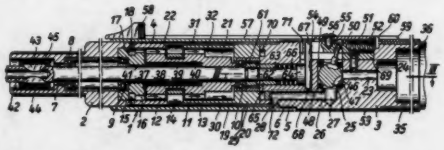
A gas turbine having a rotor serving as both compressor and turbine, and utilizing a plurality of non-rotating arcuate members disposed in spaced relation about the periphery of the rotor. These arcuate members are involved in the directing of the flow of combustion products into proximity of the blading of the turbine, to cause its rotation, and by virtue of their advantageous design, these arcuate members not only help establish a cool air boundary against which the combustion products react and thus minimize heating of the blades, but also form passages for the subsequent exhausting of the combustion products.

3,709,630

PNEUMATIC MOTOR FOR MEDICAL INSTRUMENTS

Fritz G. Pohl, and Arnold Keller, both of Kiel-Dietrichsdorf, Germany, assignors to Howmet International, Inc. Zweigniederlassung Kiel, Kiel-Dietrichsdorf, Germany

Filed Aug. 7, 1970, Ser. No. 62,020
Claims priority, application Germany, Oct. 28, 1969, P 19 54 130.1
Int. Cl. A61c 1/05; F01d 1/10; A61b 17/32
U.S. Cl. 415—199 3 Claims



The invention relates to a small pneumatic motor for a rotating medical instrument, especially for drilling or milling instruments. A shaft with a turbine is supported in a housing with the gas inlet end of the turbine arranged towards the output end of the motor. The driving gas flows to the turbine inlet side via channels arranged longitudinally in the housing along the periphery of the turbine and then back to the input end of the housing. Discharge of driving gas at the output end of the housing toward the patient is avoided in this way.

ERRATUM

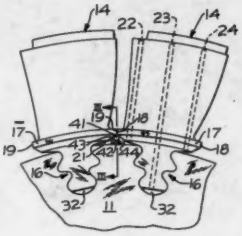
For Class 415—17 see:
Patent No. 3,709,626

3,709,631

TURBINE BLADE SEAL ARRANGEMENT

Karl W. Karstensen, Peoria, Ill.; James M. Koch, Tremont, Ill., and Wallace A. Hoftiezer, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed March 18, 1971, Ser. No. 125,495
Int. Cl. F01d 5/18
U.S. Cl. 416—95 17 Claims



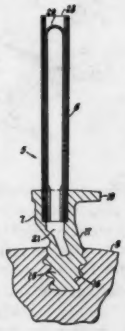
A seal arrangement for a turbine assembly including a turbine wheel, having a plurality of circumferentially arranged blades with adjacent edges of the blades being axially arranged above passages in the wheel assembly and retaining members arranged on each axial side of the wheel, a seal assembly between each adjacent pair of blades including an elongated seal member with means for maintaining the seal member in alignment with an axial recess formed by adjacent edges of the blade so that the seal member is urged radially outwardly into sealing engagement with the blades during rotation of the wheel and annular seal rings for maintaining sealing engagement between the retaining members and the plurality of blades.

3,709,632

BLADE TIP CLOSURE

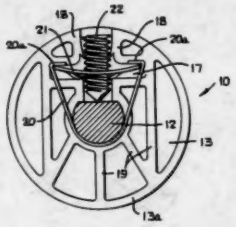
Calvin W. Emmerson, and Ronald P. Schwedland, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 850,522, Aug. 15, 1969, abandoned. This application Feb. 12, 1971, Ser. No. 115,105
Int. Cl. F01d 5/08
U.S. Cl. 416—97 2 Claims



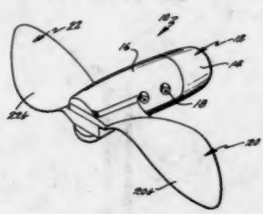
A hollow laminated sheet metal transpiration-cooled porous turbine blade has its free end closed to prevent escape of cooling fluid from the end of the blade. This closure is made by separating the inner layer of the blade wall from the other layers and bending it inward from each face of the blade so that the inner layers from each face of the blade meet approximately along the mean camber line of the blade, where they are welded together to provide the closure. The closure is spaced from the blade tip, located within the cooled blade walls.

3,709,633
REINFORCED PLASTIC FAN HUB
John A. Wooden, Indianapolis, Ind., assignor to Brookside Corporation, McCordsville, Ind.
Continuation-in-part of Ser. No. 118,379, Feb. 24, 1971. This application Oct. 7, 1971, Ser. No. 187,347
Int. Cl. F04d *29/20*
U.S. Cl. 416—134 4 Claims



Disclosed is a hub formed of plastic which carries a fan spider, blower wheel or other driven member and has a central bore to accommodate a motor shaft. A cavity is formed in the hub and accommodates a resilient leaf is is threaded on a shaft-engaging set screw extending radially into the central bore. Tightening the set screw on the shaft distorts the resilient member and the internal restoring force thereby exerted by the resilient member holds the hub locked on the shaft despite the normal cold-flow or creep of the hub material. A reinforcing steel band in the hub extends from the areas of engagement of the distorted resilient member with the cavity walls to and around a portion of the central bore surface.

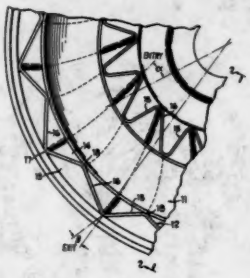
3,709,634
FOLDING BLADE PROPELLER
Eldon L. Lorenz, Grand Rapids, Mich., assignor to Michigan Wheel Corporation, Grand Rapids, Mich.
Filed Jan. 20, 1971, Ser. No. 108,000
Int. Cl. B63h *1/24*
U.S. Cl. 416—142 4 Claims



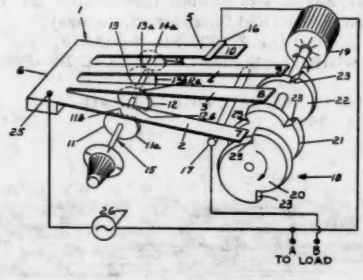
A foldable marine propeller assembly is disclosed having a pair of interengaged housing members that are releasably secured together by fasteners, locking the blade mounting swivel pin in blind sockets when so fastened, and that cooperatively define a recess for the securement nut to a drive shaft extending into the housing, the nut being retained against rotation.

3,709,635
HYDRAULIC COUPLING
John Saxon Ivey, Hitchin, England, assignor to Borg-Warner Limited, Letchworth, Hertfordshire, England
Filed Sept. 18, 1970, Ser. No. 73,526
Int. Cl. F01d *5/04*
U.S. Cl. 416—183 4 Claims

A hydraulic coupling member including an outer hollow part-toroidal shell and an internal hollow part-toroidal core ring and blading between and connected to the shell and core ring, the blading being provided by an undulating element with the undulations of generally triangular section providing back-to-back triangular section flow channels. The undulating element can be cast or stamped in a single piece, or formed segmentally and secured together, and then connected to the shell and core ring.



3,709,636
TIMER
David Rosenberg, Glen Cove, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.
Continuation-in-part of Ser. No. 643,083, June 2, 1967, Pat. No. 3,447,479, Division of Ser. No. 830,078, June 3, 1969, Pat. No. 3,610,848. This application Sept. 4, 1970, Ser. No. 69,981
Int. Cl. F04b *49/00*
U.S. Cl. 417—12 4 Claims

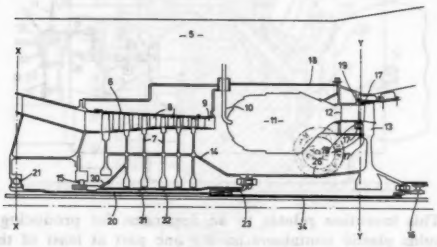


A piston pump is provided, adapted to pump measured fluid volumes at selected time intervals, including a timer having a plurality of selectable timing intervals, and a timer switch actuated by the timer to open and close the electric circuit to the pump drive means at a selected time interval, to initiate a stroke of the pumping plunger of the piston pump. Pump drive switch actuating means associated with the pump drive means opens the pump drive switch whenever the plunger is in a starting position and turns off the pump drive means, and closes the pump drive switch whenever the time switch closes and starts operation of the pump drive means, the pump drive switch remaining in the closed position until the plunger starting position, the timer switch overriding the pump drive switch to start the pump drive means only at the starting position for a stroke of the plunger, and the timer and pump drive switches together thereby controlling the plunger operation stroke-by-stroke to control the fluid volume delivered per time interval according to the number of strokes per time interval.

3,709,637
GAS TURBINE ENGINES

James Alexander Petrie, Littleover; Terence Edward Gouvenot Gardiner, Littleton-upon-Severn, near Bristol, and John Aaron Clampitt, Bristol, all of England, assignors to Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Breat Britain and Northern Ireland, Whitehall, London, England

Filed Aug. 9, 1971, Ser. No. 169,994
Claims priority, application Great Britain, Aug. 14, 1970, 39,173/70
Int. Cl. F02c 7/20
U.S. Cl. 417—405 8 Claims

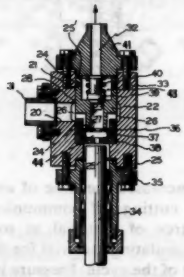


In order to minimize the variation in the sealing clearance between a turbine rotor and associated static structure at different temperatures of the engine the shaft connecting the turbine with its compressor is supported at its ends in roller bearings. A tubular member is introduced, which is made of a low expansion material, which is located at an upstream datum radial plane and which supports the shaft at a joint close to the turbine rotor. The expansion of the shaft between the upstream roller bearing and the joint does not therefore, affect the position of the turbine rotor.

3,709,638
PLUNGER PUMP CYLINDER FOR USE IN TREATING HIGHLY CORROSIVE FLUID

Jintaro Iguchi, and Hiroyuki Tokushige, both of Hiroshima, Japan, assignors to Japan Steel Works Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 796,454, Feb. 4, 1969, abandoned. This application Oct. 22, 1970, Ser. No. 83,171
Claims priority, application Japan, Feb. 24, 1968, 43/13668
Int. Cl. F04b 21/02, 39/10
U.S. Cl. 417—454 1 Claim

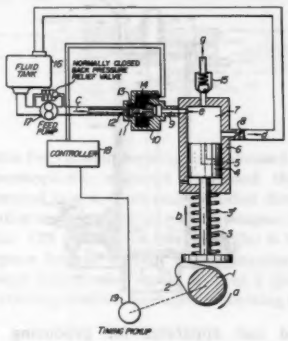


A plunger pump cylinder for use in treating highly corrosive fluid. The pump is composed of two parts, a cylinder body and a valve seat body. The valve seat body has a central longitudinal bore formed therein, and it is fitted within a bore formed in the cylinder body. At the respective ends of the bore in the valve seat body are an inlet valve and a delivery valve.

3,709,639
DISCHARGE CONTROLLED RECIPROCATING PUMPS

Toshi Suda, Nagoya; Hisanori Kobayashi, Kariya, and Senichi Nagata, Nagoya, all of Japan, assignors to Nippondenso Kabushiki Kaisha, Aichi-ken, Japan

Filed March 27, 1970, Ser. No. 23,426
Claims priority, application Japan, May 19, 1969, 44/38637
Int. Cl. F04b 7/04; F02m 39/00
U.S. Cl. 417—493 6 Claims

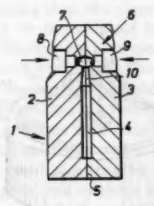


The discharge controlled pump means comprises a piston, a cylinder and an electromagnetic valve provided in a fluid inlet passage communicating with a compression chamber formed between the piston and a cylinder. The electromagnetic valve is normally open to provide for supply of fluid into the compression chamber but is closed when the volume of the compression chamber has been decreased in the upward stroke of the piston to a value corresponding to a desired discharge quantity of fluid, whereby the fluid is confined and metered in the compression chamber.

3,709,640
MEANS FOR THE PRODUCTION OF MOULDED COMPONENTS FROM CHEMICAL COMPONENTS WHCH REACT QUICKLY WITH ONE ANOTHER

Heinrich Boden, Opladen; Karl Breer, Cologne; Gunther Klessmann, Leverkusen, and Ulrich Knipp, Schildgen-Nittum, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 15, 1970, Ser. No. 72,298
Claims priority, application Germany, Sept. 27, 1969, P 19 48 999.7
Int. Cl. B29d 27/04
U.S. Cl. 425—4 7 Claims

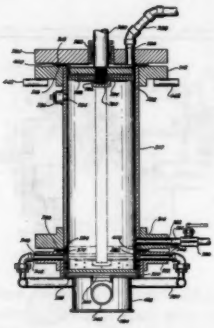


For better put out of moulded articles which are manufactured from chemical components reacting quickly with one another, a moulding tool is used which is immediately connected with the mixing chamber for the components, wherein the separation plane of the moulding tool passes through the mixing chamber and the sprue directly adjoints the mixing chamber.

3,709,641
APPARATUS FOR PREPARING AND EXTRUDING A GELATINOUS MATERIAL

Amir M. Sarem, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 726,840, May 6, 1968, Pat. No. 3,558,759. This application Aug. 3, 1970, Ser. No. 60,477
Int. Cl. B28b 1/54; B29b 1/02
U.S. Cl. 425—7 11 Claims

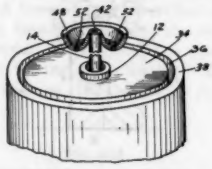


A method and apparatus for producing particulated gelatinous substances, such as gelatinous polymers, and solutions of these materials in which the gel is formed, in a reaction chamber equipped with a hydraulically actuated piston and perforate extrusion head and the gelatinous product is subsequently extruded into a stream of solvent or nonsolvent fluid flowing at relatively high velocity on the exterior of the perforate head. The gelatinous substance is displaced from the reaction chamber by introducing a fluid into the reaction chamber above the piston at a sufficiently elevated pressure to displace the substance from the chamber through the perforate extrusion head. The hydraulic pressure actuating the piston is adjusted to maintain the piston in pressure balance during the extrusion operation. Gravitational forces acting upon the piston cause it to rest upon the upper surface of the gelatinous mass and to advance downwardly through the reactor as the gel is displaced from the chamber. The method and apparatus of this invention is particularly suited for the preparation of aqueous polymer solutions useful as flooding agents in the recovery of petroleum by water flooding, and is especially adapted for installation at the site of a water injection well.

3,709,642
TUBE COATING FILM AND APPARATUS

Forrest B. Stannard, 1910 N.E. 43 Court, Oakland Park, Fla.

Continuation-in-part of Ser. No. 14,403, Feb. 26, 1970, abandoned. This application Dec. 2, 1970, Ser. No. 94,355
Int. Cl. B05c 7/00; B29c 17/07; B29d 7/20
U.S. Cl. 425—72 1 Claim

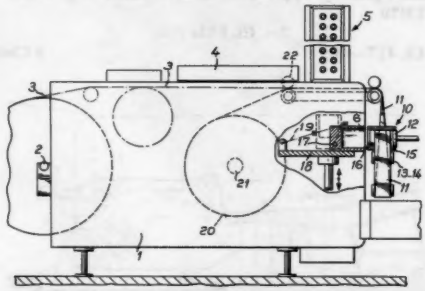


This invention relates to an apparatus for coating the inside of tubular film manufactured by a blown film process. The coating apparatus includes a dispensing means comprising a coating conduit passing through a tubular film die into a pressurized area of the said film with a distributing means connected to the coating conduit, said distributing means include a vaporizing means having temperature control means.

3,709,643
APPARATUS FOR PRODUCING CONTAINERS WITH COMPLEX WALLS

Jean R. Nasica, Paris, France, assignor to Intercan S.A., c/o Fiduciaire Wanner S.A., Fribourg, Switzerland

Continuation of Ser. No. 18,123, March 10, 1970, abandoned. This application July 12, 1971, Ser. No. 161,872
Int. Cl. B29c 17/04, 27/18; B32b 3/18
U.S. Cl. 425—109 28 Claims



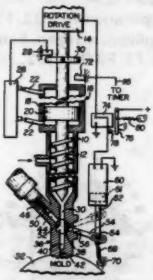
This invention relates to an apparatus for producing in moulds plastic containers having one part at least of their lateral walls a reinforcing sheet.

This apparatus is particular in that associated with each female mould is a device for forming a loop in the reinforcing sheet, and a member for placing said loop in the corresponding mould, and that said mould is disposed on a carrier so as to be capable of coming into alignment with the loop forming device, and that means are provided to control, stepwise and sequentially, the formation of a loop in the reinforcing sheet, the alignment of the mould and the forming device, the introduction of the loop into the mould, the re-setting of the mould into the shaping position, and the shaping of a container with complex walls.

3,709,644
TIME SAVER PLASTIC DRAW-BACK VALVE ASSEMBLY

John J. Farrell, 40 Abby Lane, Greenbrook, N.J.

Filed Nov. 25, 1970, Ser. No. 92,816
Int. Cl. B29f 1/04
U.S. Cl. 425—160 9 Claims

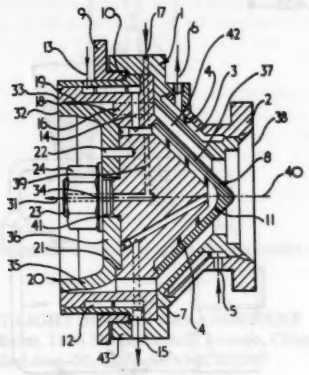


This invention decreases the time of an injection molding machine cycle by cutting off communication between the mold and the source of material as soon as injection is complete, and accumulating material for the next charge during the cooling part of the cycle. Pressure is maintained on the material in the mold, and material is supplied to compensate cooling shrinkage, from an auxiliary cylinder in which a minor amount of hot material is accumulated. After sufficient cooling, runner material is drawn back by suction of the auxiliary cylinder. A three-way valve cuts off the main material supply and puts the auxiliary cylinder in communication with the mold.

3,709,645
EXTRUSION HEAD

Hans Mraz, Grossauheim, Germany, assignor to Dunlap Holdings Limited, London, England

Filed June 22, 1970, Ser. No. 48,168
Claims priority, application Germany, July 3, 1969, P 19 33 920.9
Int. Cl. B29f 3/04
U.S. Cl. 425—192 3 Claims

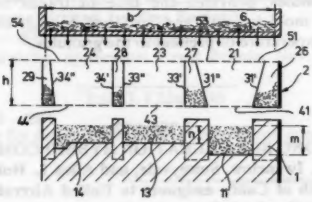


An extruder head having a housing, extruder core and core holder in which the limiting surfaces of the exit channel are formed on the extruder core and on the core holder respectively. The construction of the head can be extremely compact and enables extrusions of predetermined wall thickness to be obtained, of which the following is a specification.

3,709,646
APPARATUS FOR PRODUCING COMPRESSION-MOLDED ARTICLES

Edmund E. Munk, Oberstenfeld, Germany, assignor to Furnier-und Sperrholzwerk J. F. Weg Jr. K. G., Werzalit-Pressholzwerk, Oberstenfeld, Germany

Division of Ser. No. 883,432, Dec. 9, 1969, abandoned. This application April 29, 1971, Ser. No. 138,667
Int. Cl. B29c 29/00
U.S. Cl. 425—217 3 Claims

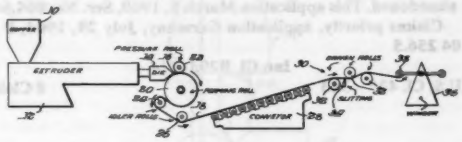


An apparatus for simultaneously filing a plurality of mold compartments of different depths to substantially the same upper level by moving a filling machine over a filling gate which is provided with apertures the lower outlet ends of which are in vertical alignment with the upper end s of the mold compartments, and in which one or more of the walls of the aperture through which a deeper mold compartment is to be filled are inclined so that the mixture will also fall thereon and then slide into the deeper compartment so as to compensate for the greater depth of this compartment.

3,709,647
APPARATUS FOR FORMING AN EMBOSSED THERMOPLASTIC SHEET

Charles Calvin Barnhart, Hoffman Estates, Ill., assignor to Clear Pack Company, Schiller Park, Ill.

Filed Oct. 21, 1970, Ser. No. 82,756
Int. Cl. B29d 7/10
U.S. Cl. 425—224 3 Claims

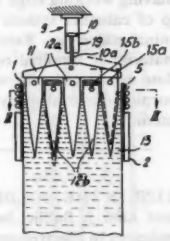


An apparatus for vacuum forming an embossed design on a sheet of thermoplastic material. Softened thermoplastic material is formed into a sheet and extruded directly onto a vacuum-forming embossing roller, and subsequently removed from the roller. The core of the forming roller is hollow, with an annular space formed therein. A rod member is spirally wrapped around this annular space to form a spiral channel for passing a cooling medium through the forming roller.

3,709,648
APPARATUS FOR THE PRODUCTION OF BLOCKS FROM SODIUM HYDROXIDE SOLUTION

Hans Kuhnlein, Fullinsdorf, Switzerland, assignor to Hch. Bertrams Aktiengesellschaft, Basel, Switzerland

Filed Nov. 27, 1970, Ser. No. 93,165
Int. Cl. B22d 11/10, 11/12
U.S. Cl. 425—224 3 Claims



Solid blocks are formed from sodium hydroxide solution by supplying molten lye by gravity feeding to a vertical cooling shaft and cooling the solution from above in repeated incremental steps while ejecting the solidified extrusion from the shaft downwardly. The cooling and the ejection are carried out by the displaceable downward movement of cooling elements. After each cooling step, the elements are retracted and the shaft is filled up to the original level with the sodium hydroxide solution. During each subsequent step at least a portion of the refill melt present between the solidified extrusion and the cooling elements is solidified by cooling. The apparatus advantageously includes a vertically elongated cooling tower having cutting means associated with the lower end thereof for cutting the extrusion which is ejected through the lower end in desired block size lengths. The cooling elements advantageously comprise one or more fixed cooling elements and one or more elements which move into and out of the tank from above. The elements are tapered conically downwardly in order to facilitate the separation of the elements from the solidified material after it is formed. The shaft is provided with cooling coils adjacent the upper end thereof for aiding in the solidification and also with heating coils directly adjacent the top of the shaft in order to maintain a melted condition or a controlled melted or solid condition in accordance with preferred operating procedures.

3,709,649

APPARATUS FOR MANUFACTURING FOILS OF RIGID THERMOPLASTIC MATERIAL

Johann Dobler, Unterneukirchen near Muhldorf/Inn; Leopold Hausner, Neutting Inn; Andreas Kolbe, Burgkirchen (Alz.), and Hans Tittus, Wiesbaden, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 475,821, July 29, 1965, abandoned. This application March 5, 1969, Ser. No. 804,648

Claims priority, application Germany, July 29, 1964, P 15 04 256.5

Int. Cl. B29d 7/14

U.S. Cl. 425—363 8 Claims

Apparatus for manufacturing foils of rigid thermoplastic material comprises plurality of rollers forming calender system and blade having working edge located within at least terminal roller gap of calender system for removing surplus material from terminal roller gap. Removal of surplus maintains amount of material at terminal roller gap substantially constant. Baffle plate associated with working edge of blade directs removed surplus material away from terminal roller gap of calender system.

3,709,650

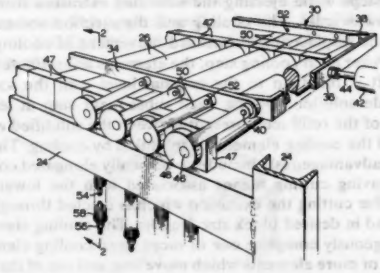
PRESS FOR USE IN THE MOLDING OF PARTS

Jerome Gutoski, and Alan J. Baillie, both of Kitchener, Ontario, Canada, assignors to Electrohome Limited, Kitchener, Ontario, Canada

Filed Nov. 5, 1970, Ser. No. 87,159

Int. Cl. B29c 3/02, 15/00; B29d 7/14

U.S. Cl. 425—367 3 Claims



A press for applying pressure to an object, typically a mold, moving through it includes cooperating rollers and back-up means to apply pressure to the object during the passage through the mold. A group of the rollers may be moved further away from the back-up means so that an object may be loaded in the press.

3,709,651

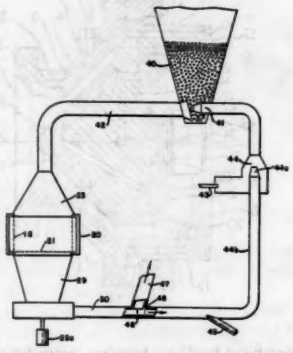
APPARATUS FOR THE PRODUCTION OF SHAPED ARTICLES OF EXPANDED COHERED GRANULES OF THERMOPLASTIC MATERIAL, IN PARTICULAR POLYSTYRENE

Andre Rivat-Lahousse, Paris, France, assignor to Saint-Gobain, Neuilly sur Seine, France

Division of Ser. No. 781,372, Dec. 5, 1968, abandoned. This application Sept. 8, 1970, Ser. No. 69,905

Int. Cl. B29d 27/00; B29g 7/02

U.S. Cl. 425—4 8 Claims



Method and apparatus for treating discrete granules of thermoplastic material, such as polystyrene, to form articles of desired shapes and forms. The granules, containing a blowing agent, are rapidly preheated to about their softening temperature and immediately deposited into a mold which is preferably also preheated. After enclosure in the mold, the material is insufflated with steam to cause expansion and cohesion of the granules to create the desired shape or form such as blocks, plates, sheets and specially-shaped articles as determined by the molding means. The steam may be saturated, under pressure, or superheated and at atmospheric pressure. In the latter case the temperature is about that of the softening point of the material, such as 115° C in the case of polystyrene, and the method can be carried out without use of an autoclave and in a continuous procedure. The granules may be preheated and conveyed to the mold, at one and the same time, by entraining them with heated gas, thus conveying them in and through a duct, into the mold. The entraining gas, such as air, may be at a temperature above the softening point of the granules, provided the time of transit from supply hopper to mold is small and just long enough to effect the desired temperature of preheat to the granules.

3,709,652

VERY LONG BURN DURATION HYBRID COMBUSTOR

Bernard L. Iwanciow, Sunnyvale, and Allen L. Holzman, Palo Alto, both of Calif., assignors to United Aircraft Corporation, East Hartford, Conn.

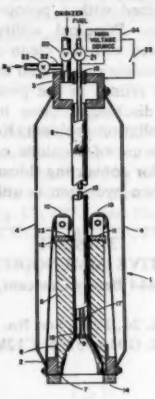
Filed May 19, 1969, Ser. No. 825,886

Int. Cl. F21k 5/00

U.S. Cl. 431—96 8 Claims

A long burning hybrid combustor is described wherein an oxidizer injector is mounted within a centrally extending port in a fuel grain, the injector outlet being in proximity to the truncated end of a concave conical surface formed by a cavity in the downstream end of the fuel grain. The downstream end of the fuel grain is restrained and constant force means are employed to drive the grain in a downstream direction as the grain is burned. Ignition means comprising a coaxially extending tube, mounted within the oxidizer injector, supplying a

gaseous fuel to form a combustible mixture at the outlet of the



injector and means for forming a spark at the outlet are also described.

3,709,653

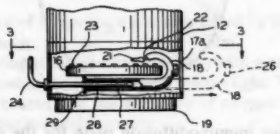
PILOT LIGHT BURNER ARRANGEMENT

Vincent D. Figliuzzi, 1101 North Central Avenue, Chicago, Ill.

Filed Aug. 20, 1970, Ser. No. 65,607

Int. Cl. F23q *9/00*

U.S. Cl. 431—279 **7 Claims**



A pilot light burner arrangement wherein the pilot light burner is amenable to being removed from the appliance it serves while still connected to the source of gas fuel. The pilot light can thus be lit while it is outside of the appliance and then while lit, replaced within the appliance to enable the automatic lighting of the main burner. The arrangement eliminates the difficulty of lighting the pilot light burner while it is within the appliance.

3,709,654

BURNER

Denis Henry Desty, Weybridge, and Christopher John Young, Chertsey, both of England, assignors to The British Petroleum Company Limited, London, England

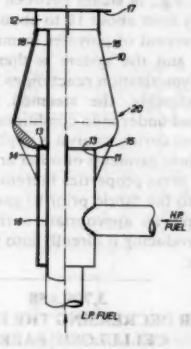
Filed Oct. 6, 1970, Ser. No. 78,479

Claims priority, application Great Britain, Nov. 19, 1969, 56,547/69

Int. Cl. F23q *9/00*

U.S. Cl. 431—284 **2 Claims**

A burner for disposing of a high pressure and a low pressure stream of gaseous fuel in which the high pressure fuel passes through an air entrainment nozzle to produce an air/fuel mixture. The flow of the mixture is diverted to produce a low pressure zone into which the low pressure fuel flows. In a modification there is a second entrainment nozzle so that the high pressure fuel enters the low pressure fuel so as to assist its flow.



3,709,655

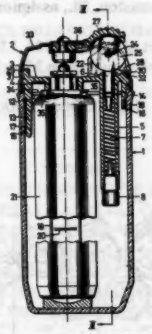
CIGARETTE LIGHTER

Willem Beijering, Volmolenstratt, Zweeloo, Netherlands, assignor to Gebrs. van Poppel N.V., Assen, Netherlands

Filed Dec. 31, 1970, Ser. No. 103,125

Int. Cl. F23q *2/16*

U.S. Cl. 431—344 **5 Claims**



A cigarette lighter with a replaceable fuel reservoir consisting of a minimum number of parts, which are easy to manufacture and due to which it is easy to replace the fuel reservoir, and which admits of easy handling.

CHEMICAL

3,709,656

PROCESS FOR DYEING AND FINISHING FIBROUS MATERIAL

Masaki Kusuhara, Tokyo, Japan, assignor to Wacom Ltd., Tokyo, Japan

Filed May 19, 1970, Ser. No. 38,904

Claims priority, application Japan, Dec. 30, 1969, 45/1761

Int. Cl. D06p *5/00, 7/00*

U.S. Cl. 8—17 **6 Claims**

A solvent dye solution which comprises a suitable dye in an organic solvent and a polymer or polymerizable monomer of a silicon compound.

3,709,657

WET FIXATION OF RESINS IN FIBER SYSTEMS FOR DURABLE PRESS PRODUCTS

Norman R. S. Hollies, Bethesda, and Steven R. Chafitz, Rockville, both of Md., assignors to Cotton, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 764,950, Oct. 3, 1968, abandoned. This application Jan. 19, 1971, Ser. No. 107,719

Int. Cl. D06m *15/58, 15/52*

U.S. Cl. 8—116.3 **18 Claims**

Creaseproofing resins are rapidly and continuously wet fixed on a fiber system such as a cotton fabric, for use in the

production of durable press articles.

In this process, a bath containing a mixture of polymer forming and crosslinking agents and an acid catalyst is applied to the cellulosic fiber system; the wet swollen fibers are heated and held under highly humid or substantially non-evaporative, hot conditions, e.g., in steam between about 100° and about 140°C., for only from about 10 to about 90 seconds so that at least about 3 percent of polymer forming resin becomes wet fixed thereon; and the system is then promptly cooled to quench the polymerization reaction as well as minimize resin hydrolysis. Preferably, the steamed fabric is neutralized, washed and dried under mild conditions. If the catalyst is thus removed, a latent curing catalyst is applied to such a fabric before it is made into garments or other articles and dry cured to impart durable press properties thereto. Instead of applying a latent catalyst to the fabric prior to garment fabrication, it is possible to apply an appropriate curing catalyst at a later stage, as by introducing it directly into the vapor space of the curing chamber.

3,709,658

METHOD FOR DECREASING THE FLAMMABILITY OF CELLULOSIC FABRICS

William Kershaw Walsh, and Henry Ames Rutherford, both of Raleigh, N.C., assignors to Research Corporation, New York, N.Y.

Filed Nov. 22, 1971, Ser. No. 201,213
Int. Cl. D06m *13/40, 15/36, 11/04*
U.S. Cl. 8—129 **2 Claims**

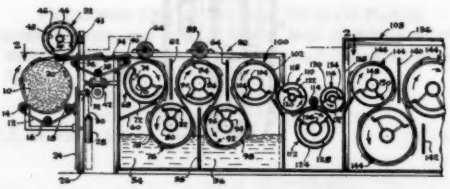
Cellulosic fabrics are rendered less flammable by reaction of acrylamidomethyl cellulose with sodium hypophosphite in the presence of ionizing radiation and then with bromine.

3,709,659

PROCESSING OF DISCRETE ARTICLES WITHOUT JOINING SAME

Justin J. Wetzler, Evanston, Ill., assignor to F. W. Means Company

Continuation-in-part of Ser. No. 826,138, May 20, 1969, Pat. No. 3,571,830. This application March 22, 1971, Ser. No. 126,715
Int. Cl. D06f *35/00*
U.S. Cl. 8—137 **6 Claims**



A process and apparatus for conditioning discrete articles where the articles to cleanse or otherwise condition the articles for use where the articles are moved through a liquid bath and then passed through a rinse section and a dryer to remove moisture to return the articles to a substantially dry condition and to iron the articles to finished form.

3,709,660

CATALYTIC TREATMENT OF THIOSULFATE CONTAINING SOLUTION WITH HYDROGEN TO PRODUCE SULFIDE

Peter Urban, Northbrook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 749,341, Aug. 1, 1968, abandoned. This application Jan. 14, 1971, Ser. No. 106,582
Int. Cl. C01c *1/20;* **C01b** *17/28, 17/42*
U.S. Cl. 423—566 **12 Claims**

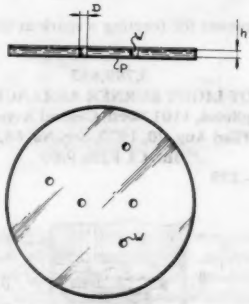
A water-soluble, inorganic thiosulfate compound is reduced to the corresponding sulfide compound by contacting an aqueous solution of thiosulfate compound and hydrogen with a catalyst, comprising a catalytically effective amount of cobalt sulfide combined with a porous carrier material, at reduction conditions. Principal utility of this treatment procedure is associated with the clean-up or regeneration of aqueous streams containing undesired thiosulfate compounds so that they can be reused in the process which originally produced them or discharged them into a suitable sewer without causing a pollution problem. Key feature of the disclosed method is the use of a unique catalyst which has extraordinary activity for converting thiosulfate to sulfide in an aqueous solution when hydrogen is utilized as the reducing agent.

3,709,661

IGE (γE) SENSITIVE IMMUNODIFFUSION PLATE

Thomas Hubscher, 2444 Benny Crescent, Apt. 409, Montreal, Quebec, Canada

Filed Dec. 24, 1970, Ser. No. 101,364
Int. Cl. G01n *33/16;* **C12k** *1/06*
U.S. Cl. 23—253 R **22 Claims**



A sensitive immunodiffusion plate for the quantitation of IgE (γE) in human serum and other biological fluids, with the lower limit of sensitivity at 300 ng/ml and an accurate detection range of 0.045 – 0.25 mg % (450–2,500 ng/ml) protein. The immunodiffusion plate has the following geometrical proportions:

$$\frac{h \text{ (thickness of the gel)}}{D \text{ (diameter of well)}} = 0.22\ (+0.03) \text{ max.}$$

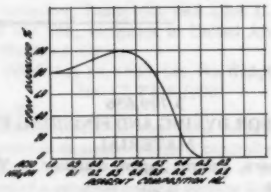
A 1 percent agarose solution including a borate buffer, sodium citrate and glycine is used for the preparation of the gel. Fetal calf serum is incorporated as diluent for the antisera.

3,709,662

IRON ANALYSIS REAGENT FORMULATION

Clifford C. Hach, Ames, Iowa, assignor to Hach Chemical Company, Ames, Iowa

Filed July 20, 1970, Ser. No. 56,361
Int. Cl. G01n *31/22, 33/18*
U.S. Cl. 23—230 R **10 Claims**



A single reagent formulation for use in the spectrophotometric determination of iron, which is capable of carrying out the multiple functions required in the spectrophotometric determination, comprises a solution of thioglycolic acid, a buffer to maintain the pH of the solution at

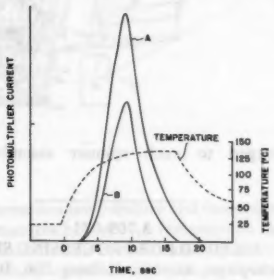
a predetermined value or range and a ferroin reagent present in an amount effective to form a colored complex with the iron in a test sample. Superior solubilizing of the iron in a test sample is achieved when ammonium hydroxide serves as the buffer.

3,709,663

METHOD OF DETECTING OXYGEN IN A GAS

Herbert D. Hendricks, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Aug. 17, 1971, Ser. No. 172,459
Int. Cl. G01n *21/22, 21/34*
U.S. Cl. 23—232 R **7 Claims**



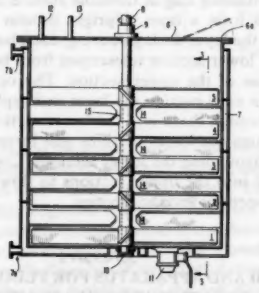
The presence of oxygen in a gas is detected by contacting an article, such as a film, comprising poly(ethylenenaphthalenedicarboxylate) with a gas and simultaneously exposing the article to ultraviolet light. The article is subsequently heated and the presence of oxygen in the gas is indicated by thermoluminescence.

3,709,664

HIGH SHEAR MIXING APPARATUS FOR MAKING SILICA GELS

Jerome H. Krekeler, Cincinnati; Charles H. Wehr, Butler, both of Ohio, and Henri A. Aboutboul, Byram, Conn., assignors to National Petro-Chemicals Corporation, New York, N.Y.

Filed Aug. 14, 1970, Ser. No. 70,623
Int. Cl. C01b *33/16;* **B01j** *1/04;* **B01f** *7/20*
U.S. Cl. 23—285 **11 Claims**



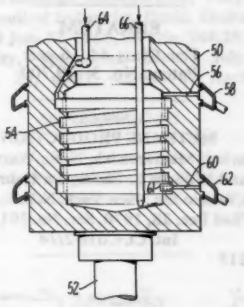
Apparatus comprising a rotary agitator possessing movable sets of flat blades interspersed with stationary sets of flat blades, the pitch and clearances of the blades being such that high shear agitation is obtained. This apparatus is suitable for use in the carrying out of any process requiring high shear mixing. It has been found to be particularly useful in the preparation of silica gels of high quality.

3,709,665

SOLVENT EXTRACTION APPARATUS

Dale M. Coulson, 884 Colorado Ave., Palo Alto, Calif.

Filed June 15, 1970, Ser. No. 46,122
Int. Cl. B01d *11/04*
U.S. Cl. 23—269 **6 Claims**



A solvent extraction apparatus is provided wherein the materials being extracted flow countercurrently along the walls of a rotating cylinder in contact with each other. The apparatus may be either of the batch or the continuous type. Preferably a helical path is provided.

3,709,666

PROCESS OF RECOVERING AMMONIUM SULPHATE FROM AN AQUEOUS SOLUTION CONTAINING AMMONIUM SULPHATE AND METHIONINE

Jan Van Westerveld, Geleen, and Jozeph Marie Van Doorn, Sittard, both of Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

Filed Oct. 20, 1969, Ser. No. 867,885
Claims priority, application Netherlands, Oct. 19, 1968, 6815005
Int. Cl. B01d *9/02;* **C01c** *1/24*
U.S. Cl. 23—300 **4 Claims**

A process for recovering ammonium sulfate from an aqueous solution containing ammonium sulfate and methionine by precipitating ammonium sulfate with a monovalent aliphatic alcohol.

3,709,667

DISPERSION STRENGTHENING OF PLATINUM GROUP METALS AND ALLOYS

Gordon Leslie Selman, and Alan Sidney Darling, both of London E.C.1, England, assignors to Johnson, Mathey & Co., Limited, London, England

Filed Jan. 19, 1971, Ser. No. 107,812
Int. Cl. C22c *31/04*
U.S. Cl. 29—182.5 **20 Claims**

This specification describes a method of producing dispersion strengthened metals or alloys by alloying the metal or alloy with a minor amount of a material capable of forming a stable refractory compound. The so formed alloy is converted to granular or powder form and the powder is then cold worked prior to exposing the cold worked and so deformed granules to a gas at a temperature so as to form a stable refractory compound within the metal or alloy. Thereafter the metal or alloy particles are compacted and sintered to form an ingot.

3,709,668

GASOLINE COMPOSITION PROVIDING ENHANCED ENGINE OPERATION

Abraham A. Zimmerman, New Providence; Louis E. Furlong, Westfield, both of N.J., and Vadekar Mohan, Sarnia, Ontario, Canada, assignors to Esso Research and Engineering Company

Filed June 30, 1971, Ser. No. 158,509
Int. Cl. C10l *1/22*
U.S. Cl. 44—72 **8 Claims**

A mixture of a beta-primary amine and a tertiary amine, each of which has a long aliphatic hydrocarbon group, when

added in minor proportion to a gasoline, will improve the distribution of the air-fuel mixture in the intake manifold of a multicylinder gasoline engine, run with the resulting blend, thereby increasing operating efficiency. A representative mixture comprises 2-amino octadecane and dimethyl hydrogenated tallow amine.

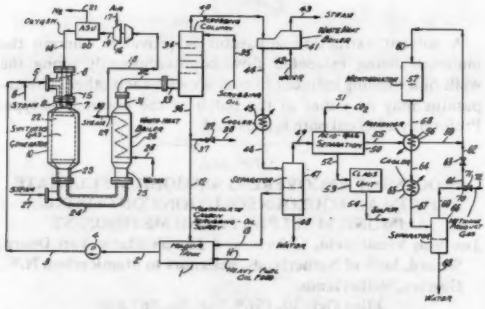
ERRATUM

For Class 44—6 see:
Patent No. 3,709,700

3,709,669
METHANE PRODUCTION

Charles P. Marion, Mamaroneck, N.Y.; Warren G. Schlinger, Pasadena, and William L. Slater, La Habra, both of Calif., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,724
Int. Cl. C01b *2/14*
U.S. Cl. 48—215 **12 Claims**



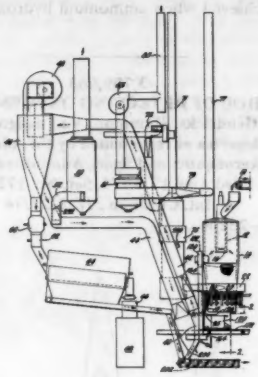
Process for the production of a methane-rich gas stream from a hydrocarbonaceous feedstock with all steps being carried out at or slightly above the desired pressure of delivery. Effluent gas from a free-flow partial-oxidation synthesis-gas generator, and preferably containing from about 10–26 volume percent methane on a dry basis is reacted with steam and without a catalyst at a temperature in the range of 2,800 to 1,500°F. to produce a stream of shifted gases having a mole ratio H_2/CO in the range of 1.5 to 4 and preferably about 3. The shifted gases are then processed by the steps of scrubbing with a liquid hydrocarbon to recover particulate carbon, cooling to condense out water and volatile hydrocarbons, purifying by eliminating H_2S and CO_2 in a separation zone, and catalytically reacting the remaining H_2 and CO in the process gas stream to produce a process gas stream comprising at least 45 volume percent methane on a dry basis.

3,709,670
METHOD, APPARATUS AND SYSTEM FOR FIBERIZING MOLTEN MINERAL MATERIAL

Herluf N. Eriksen, 22 Laclede Drive, Burlington, N.J.

Filed Sept. 10, 1970, Ser. No. 71,148
Int. Cl. C03b *19/04*
U.S. Cl. 65—8 **10 Claims**

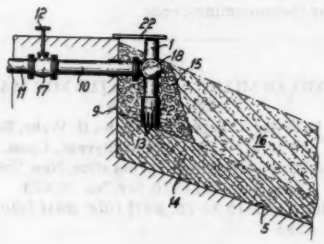
A method for converting molten material into filamentous form of fibers consisting of discharging the molten material to at least one spinner assembly disposed in the region of a pickup chamber, circulating a conveying medium through a duct work system including a pickup chamber in the region of the spinner assembly and controlling the temperature and velocity of the conveying medium in a manner to produce fibers having a minimum shot content and good strength and resiliency characteristics, an apparatus and system for converting molten material into filamentous form of fibers including a cupola for the molten material having a discharge spout, a duct work system, means for circulating the conveying medium through the duct work system, at least one pair of spinner assemblies in the region of a pickup chamber in the duct work system, feed means for directing the molten material to each of the spinner assemblies and means for maintaining the quantity discharged to each spinner assembly substantially uniform.



3,709,671
METHOD FOR PROCESSING SLAG

Fritz Forschepiepe, Asselner Hellweg 106, Dortmund-Asseln, Germany

Filed June 10, 1970, Ser. No. 44,987
Claims priority, application Germany, June 14, 1969, P 19 30 394.7; Oct. 18, 1969, P 19 52 593.0
Int. Cl. C03b *5/18*, *19/10*, *5/22*
U.S. Cl. 65—19 **4 Claims**



Iron-containing slag in flowable state is poured into a casting bed to form a layer. Upright tubular conduits are embedded in the layer during pouring, each having an upper section and a lower section telescoped from below over the bottom portion of the upper section. The upper sections have upper open ends outside the layer and explosive capsules are inserted through these into the lower sections and detonated. This ruptures the lower sections and forms in the slag layer cavities surrounding the lower sections. Cooling water is then introduced into the upper sections to flow into the layer via the lower sections and the cavities.

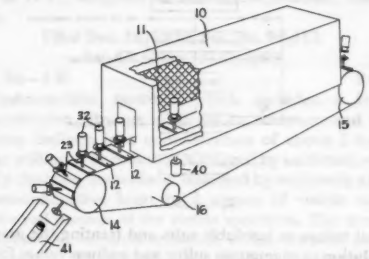
3,709,672
METHOD AND APPARATUS FOR FLUORINE SURFACE TREATMENT OF GLASS ARTICLES

Urbano J. De Santis, and Herbert C. Snyder, both of Brockway, Pa., assignors to Brockway Glass Company, Inc, Brockway, Pa.

Filed Jan. 11, 1971, Ser. No. 105,369
Int. Cl. C03c *17/00*
U.S. Cl. 65—30 **6 Claims**

It is known to render the interiors of glass containers corrosion resistant by contacting such interiors with a fluorine con-

taining gas while the glass article is hot enough to pyrolyze the fluorine containing gas and thus deposit fluorine on the glass surface. Small thin-walled glass vials do not retain enough heat to pyrolyze the fluorine gas due to rapid cooling of the vial by the gas and the relatively low deformation temperatures of such vials. The present invention provides a method and apparatus whereby the vials are heated to temperatures safely



below their deformation temperature and then exposed interiorly to gas-air mixtures heated to a temperature approaching the pyrolyzing temperature of the fluorine gas compound of the gas-air mixture. Thus the combined heat of the vial and the gas is available for instantaneously pyrolyzing the gas to deposit fluorine on the glass surface without deformation of the vials.

3,709,673

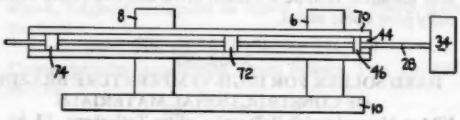
EDGE-ROLL MACHINE IN FLOAT GLASS APPARATUS

Hugh S. Bishop, Cumberland, Md., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 25, 1970, Ser. No. 92,674

Int. Cl. C03b *18/00*

U.S. Cl. 65—182 R **10 Claims**



A roll for contacting the upper surface of float glass during its production is supported upon a shaft having, near the roll, a bearing in contact with water-cooled members. The shaft, unlike those in similar edge-roll machines, need not be made of costly material resistant to high temperatures, because it is internally water-cooled and its coolant water is used to cool internally the edge roll. Because of the small distance between the bearing and the roll, wobbling of the roll with respect to the ribbon of glass is minimal. Though the edge roll of the instant invention is applicable for use in one-way stretch of float glass to produce thin float glass, it is especially useful in a process that uses edge rolls that militate against the necking down of float glass in the production of extra-thin float glass (about 2.5 millimeters or less) in a "two-way-stretch" or an "assisted-direct-stretch" process.

3,709,674

METHOD AND COMPOSITION FOR SUPPRESSING THE NITRIFICATION OF AMMONIUM NITROGEN IN SOIL

Yoshihito Goya, Itami; Michio Nakanishi; Kenichi Sawatari, both of Nakatsu; Akira Hirose, Totsuka-ku, Yokohama, and Tetsuichi Shinozawa, Chigasaki, all of Japan, assignors to Mitsui-Ioatsu Chemicals Incorporated, Tokyo and Yoshidomi Pharmaceutical Industries, Osaki, Osaka Pref., Japan

Filed July 12, 1968, Ser. No. 744,291

Claims priority, application Japan, July 26, 1967, 42/47629; Dec. 29, 1967, 42/84878; April 15, 1968, 43/22046

Int. Cl. C05g *3/08*

U.S. Cl. 71—1 **10 Claims**

A method for suppressing the nitrification of ammonium nitrogen in soil comprising treating the soil in a plant growing area with a sulfanilamide derivative and a composition therefore.

3,709,675

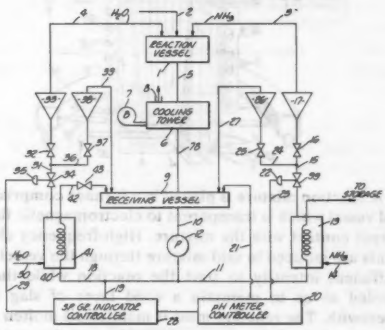
PROCESS FOR PRODUCING LIQUID NP FERTILIZERS

James Austin, Horley, England, assignor to Occidental Research & Engineering Limited, London, England

Filed April 2, 1969, Ser. No. 812,606

Int. Cl. C05b *7/00*

U.S. Cl. 71—35 **4 Claims**



Phosphoric acid, containing polyphosphoric acid components, and nitric acid are concurrently and continuously reacted with a deficiency of ammonia under high turbulent conditions to vaporize water in the reacting mixture and to expel the latter from a reaction chamber after a brief retention period; the expelled mixture is quenched by air cooling and thereafter reacted with further ammonia to near-neutrality.

3,709,676

HERBICIDALLY ACTIVE COMPOSITIONS

Joseph F. Vartiak, Naperville, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Continuation-in-part of Ser. No. 418,343, Dec. 14, 1964, Pat. No. 3,628,942. This application Feb. 8, 1971, Ser. No. 113,599. The portion of the term of this patent subsequent to Dec. 21, 1988, has been disclaimed.

Int. Cl. A01n *9/00*

U.S. Cl. 71—92 **3 Claims**

A quick acting liquid herbicidal composition comprises a major amount of a hydrocarbon oil and a 3,5,6-substituted uracil, the improvement comprising using as a co-solvent, a fatty acid having at least 12 carbon atoms in chain length.

3,709,677

N-SUBSTITUTED SULFAMOYL COMPOUNDS USEFUL AS HERBICIDES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Filed June 25, 1969, Ser. No. 836,629
Int. Cl. A01n 9/22
U.S. Cl. 71—94 7 Claims

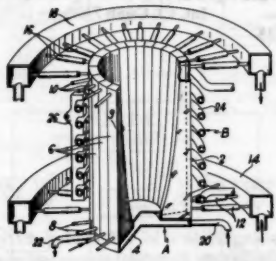
Substituted N-sulfamoyl pyridine compounds are useful in the destruction and prevention of weeds and unwanted plants.

3,709,678

PROCESS FOR THE PREPARATION OF METALS OR ALLOYS

Jean-Louis Helary, 33 Boulevard Chevre-Morte, 21 Talant; Marcel De La Graviere, 2, rue Europe, 21 Fontaine-les-Dijon, both of France, and Jean-Jacques Gallay, deceased, late of 8 Boulevard de la Solidarite, Nantes, France (by Marielle Gallay, administratrix)

Filed March 4, 1970, Ser. No. 16,520
Claims priority, application France, March 13, 1969, 6907180
Int. Cl. C22d 7/04; C22b 61/04
U.S. Cl. 75—10 R 3 Claims



A reaction mixture is placed in a furnace comprising a vertical vessel which is transparent to electromagnetic fields and in direct contact with the mixture. High-frequency electric currents are induced in said mixture through the vessel and are of sufficient intensity to start the reaction while the vessel is cooled so as to maintain a solid layer of slag in contact therewith. The reaction mass is maintained molten for a sufficient period of time to cause settling of the metal prior to solidification in situ. The vessel is throttled towards its base.

3,709,679

WUSTITE BED IMPROVEMENT

Kenneth E. Draeger, Baton Rouge, La., assignor to Esso Research and Engineering Company

Filed June 19, 1970, Ser. No. 47,648
Int. Cl. C22b 1/10; C21b 13/00
U.S. Cl. 75—26 8 Claims

In the fluidized reduction of specular hematites, the process in the wustite reducing bed is terminated prior to the formation of an equilibrium wustite composition, thereby providing for improved reducibility of the ore to metallic iron in subsequent reducing beds.

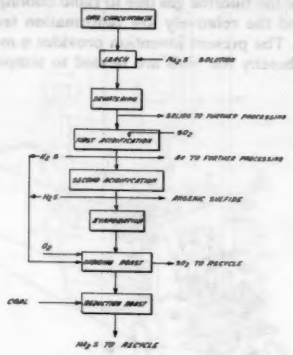
3,709,680

PROCESS FOR REMOVAL OF ARSENIC FROM SULFO-ORE

W. Church Holmes, Lake San Marcos, Calif., and Enzo L. Coltrinari, Arvada, Colo., assignors to Sunshine Mining Company, Kellog, Idaho

Filed July 9, 1971, Ser. No. 161,165
Int. Cl. C21b 1/04; C22b 61/00
U.S. Cl. 75—6 10 Claims

A process and apparatus for the removal of arsenic values from an ore concentrate includes the steps of leaching the concentrate with a solution which dissolves the arsenic, separating undissolved residue therefrom, acidifying the arsenic pregnant solution to precipitate arsenic and other



mineral values as insoluble salts and treating the arsenic barren solution to regenerate sulfur and sodium values for recycle to the process.

3,709,681

PROCESS FOR THE RECOVERY NOBLE METALS

Harold W. Wilson, El Paso, Tex., assignor to Golden Cycle Corporation

Filed Jan. 8, 1970, Ser. No. 1,563
Int. Cl. C22b 11/04
U.S. Cl. 75—109 16 Claims

Processes for and compositions utilized in the recovery of noble metals from noble metal containing substances by subjecting such substances—preferably in comminuted form—to the action of a solvent preferably comprising diacetone alcohol as a major component, water, minor amounts of glacial acetic acid potassium iodide and elemental iodine. Solvation of the noble metal occurs during agitation and heating of the slurry. The noble metal contents are removed from the noble metal pregnant solution by displacement onto a non-noble metal surface. The solid noble metal containing residue is treated with sufficient aqueous hydroxide solution to convert excess non-noble metal into its water-soluble salt. The remaining insoluble material containing the noble metal recovered is rinsed to remove any remaining unreacted alkali and the soluble salts and is then digested with concentrated sulfuric acid to dissolve any remaining acid soluble impurities, the remaining acid insoluble residue is rinsed, dried and comprises substantially pure noble metal.

3,709,682

HARD SOLDER FOR HIGH-TEMPERATURE BRAZING OF CONSTRUCTIONAL MATERIALS

Viktor Alexandrovich Belkovsky, ulitsa Tatischeva, 23, kv. 38; Leopold Leopoldovich Grzhimalsky, ulitsa Arkhitektora Vlasova, 19, korpus 3, kv. 14; Irma Irmovich Ilievsky, ulitsa Sadovo-Sukharevskaya, 19, 23, kv. 159; Sergei Nikolaevich Lotsmanov, ulitsa Grimau, 11, kv. 25; Ivan Egorovich Petrunin, Otradny proezd, 3-a, kv. 64; Anatoly Vasilievich Sukhov, 8 ulitsa Sokolinoi gory, 16, korpus 5, kv. 75; Boris Sergeevich Tikhonov, ulitsa Oktyabrskaya, 69, kv. 50; Boris Isaakovich Levin, 3 Pryadilnaya ulitsa, 18a, kv. 79; Pavel Kirillovich Moroz, Volokolamskoe shosse, 1, kv. 17; Genrikh Nikolaevich Strekalov, Graivoronovskaya ulitsa, 8, korpus 1, kv. 161; Andrei Nikolaevich Chernov, ulitsa Serafimovicha, 2, kv. 481; Sergein Ilich Chizhov, ulitsa Pyatnitskaya, 50/2, kv. 8, and Nikolai Nikolaevich Shevyakov, ulitsa Presnensky val, 8, kv. 155, all of Moscow, U.S.S.R.

Filed May 10, 1971, Ser. No. 141,938
Int. Cl. C22c 39/00
U.S. Cl. 75—134 C 4 Claims

A hard solder contains: 27–40 wt.% Mn, 11–20 wt.% Ni, 7–15 wt.% Cu, 0.5–4.5 wt.% Si , 0.02–0.5 wt.% C, 0.05–0.5

wt.% B, 0.03–10.5 wt.% Al, S and P together not in excess of 0.08 wt.%, Fe being the balance, the solder in view of the composition thereof enabling an equal-strength brazing joint to be obtained.

3,709,683

INFRARED SENSITIVE IMAGE RETENTION PHOTORECEPTOR

Anthony J. Ciuffini, Rochester, and Joseph J. Galen, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 18, 1970, Ser. No. 99,412
Int. Cl. G03g *13/22, 5/00*
U.S. Cl. 96—1 R **9 Claims**

A photosensitive member which includes a layer of photoconductive vitreous selenium or selenium and arsenic containing thallium in a concentration of about 2 to 5,000 parts per million. The member is imaged by uniformly electrostatically charging the surface, followed by uniformly exposing the photoconductive layer to a source of visible radiation below the red portion of the visible spectrum. The member is then exposed to infrared radiation in the form of an image which results in the formation of a developable latent electrostatic image contained within the photoconductive layer.

3,709,684

PHOTOCONDUCTIVE COMPOSITIONS AND ELEMENTS EMPLOYING POLYOXYALKYLENE BISPHENOL A FUMARATES AS BINDERS

Joseph Feltzin; Erich Kuehn, and George O. Rudkin, Jr., all of Wilmington, Del., assignors to ICA America Inc., Wilmington, Del.

Filed Dec. 11, 1970, Ser. No. 97,339
Int. Cl. G03g *5/00, 7/00, 5/08*
U.S. Cl. 96—1.5 **13 Claims**

Photoconductive recording materials for use in electrophotography processes are disclosed. A photoconductive composition for use in preparing the photoconductive recording materials is also disclosed as well as means for preparing the photoconductive recording materials. The particular photoconductive composition contains polyester resins based upon an etherified diphenol material and a dicarboxylic acid.

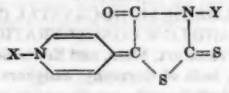
3,709,685

PHOTOCONDUCTIVE ZINC OXIDE SENSITIZED BY SUBSTITUTED THIAZOLIDENE DYES

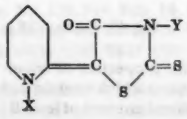
Robert James Hercock, and Simon Lindsay Scrutton, both of Ilford, England, assignors to Ilford Limited, Ilford, Essex, England

Filed Feb. 18, 1971, Ser. No. 116,314
Claims priority, application Great Britain, Feb. 19, 1970, 8,093/70
Int. Cl. G03g *5/08*
U.S. Cl. 96—1.7 **4 Claims**

This application describes electrophotographic material which comprises a photoconductive layer which has been sensitized to light of the blue region of the spectrum by the presence therein of an optical sensitizing dye of the general formula:



or of the formula:



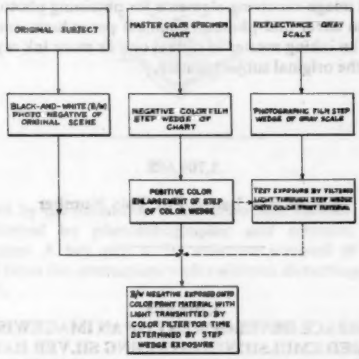
wherein at least one of X and Y is an acidic group $-(CH_2)_nCOOM$ or $-(CH_2)_nSO_3M$ wherein in each group M is a cation and *n* is an integer from 1 to 4, the other of X and Y when not a said acidic group is a hydrogen atom or an alkyl group containing from one to four carbon atoms or an aryl group.

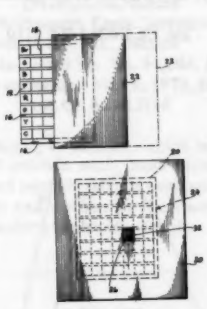
3,709,686

PROCESS FOR PRODUCING SELECTED COLOR PHOTOGRAPHS

John Buckland Erdell, 365 Clinton Avenue, Brooklyn, N.Y.

Filed May 3, 1971, Ser. No. 139,694
Int. Cl. G03f *9/00*
U.S. Cl. 96—2 **19 Claims**


ORIGINAL SUBJECT
MASTER COLOR SPECIMEN CHART
REFLECTANCE GRAY SCALE
BLACK-AND-WHITE (B/W) PHOTO NEGATIVE OF ORIGINAL SCENE
NEGATIVE COLOR FILM STEP WEDGE OF CHART
PHOTOGRAPHIC FILM STEP WEDGE OF GRAY SCALE
POSITIVE COLOR ENLARGEMENT OF STEP OF COLOR WEDGE
B/W NEGATIVE EXPOSED ONTO COLOR PRINT MATERIAL WITH LIGHT TRANSMITTED BY COLOR FILTER FOR TIME DETERMINED BY STEP WEDGE EXPOSURE



Method of producing selected color photographs from photographs recorded on black-and-white negative materials by printing the negative onto color print material with illumination filtered through a negative color film (filter) obtained by the following method:

a. making a master color specimen chart;

b. making a multi-color negative color film step wedge of said master chart;

c. making a single-color, multi-shade, multi-tint negative

color film step wedge of said multi-color negative color film step wedge, and

d. making individual negative color films (filters) of the individual wedge steps of said single color step wedge.

3,709,687

DIFFUSION TRANSFER RECEIVING ELEMENT WITH VARING CONCENTRATION OF PRECIPITATING NUCLEI

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed April 6, 1970, Ser. No. 25,875
Int. Cl. G03c 5/54
U.S. Cl. 96—29 L 18 Claims

Novel image-receiving elements for obtaining photographic images in silver and photomechanical procedures employing same as an inking master to obtain one or more ink reproductions of the original subject matter.

3,709,688

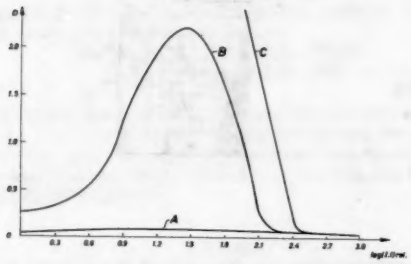
Patent Not Issued For This Number

3,709,689

SURFACE DEVELOPMENT OF AN IMAGEWISE EXPOSED EMULSION CONTAINING SILVER HALIDE GRAINS WITH CORES CHEMICALLY RIPENED IN TWO STAGES

Raymond Leopold Florens; Frans Henri Claes, both of Edegem, Belgium, and Frik Moisar, Cologne-Flittard, Germany, assignors to Agfa-Gevaert, Mortsel, Belgium

Filed April 2, 1970, Ser. No. 25,091
Claims priority, application Great Britain, April 2, 1969, 17,161/69
Int. Cl. G03c 5/24, 5/30
U.S. Cl. 96—64 7 Claims



Light-sensitive silver halide emulsion adapted for producing either negative or direct positive photographic images and containing composite grains of silver bromide having internal core portions of chemically ripened silver bromide and external shell portions surrounding such core portions of chemically fogged silver bromide, such emulsion on development with a surface developing agent having a characteristic curve which exhibits a knee portion connecting a generally rectilinear portion of positive gradient and a generally rectilinear portion of negative gradient and is preferably of generally symmetrical configuration. By adjustment of the magnitude of the exposure of the emulsion to light either a direct positive or a negative photographic reproduction is obtained.

3,709,690

NOVEL POLYMERS AND PHOTOGRAPHIC ELEMENTS CONTAINING SAME

Hyman L. Cohen; James R. King, Jr., and Louis M. Minsk, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 709,812, March 1, 1968, abandoned. This application Dec. 21, 1970, Ser. No. 100,491
Int. Cl. G03c 1/76, 1/72
U.S. Cl. 96—67 3 Claims

Polymers comprising quaternary nitrogen atoms and at least two aromatic nuclei in the polymer cation for each quaternary nitrogen atom are described. In one embodiment at least one-third of the units of said polymer comprise quaternary nitrogen atoms. In another embodiment polymers comprising at least two aromatic nuclei in the polymer cation, such as aryl groups, for each quaternary nitrogen atom can be used in photographic elements to provide excellent mordants for dyes.

3,709,691

COPYING MATERIALS FOR PHOTOGRAPHIC REFLECTION PRINTING

Kaneyasu Tani, Tokyo; Shiro Kawazoe, Kawaguchi; Mikio Eto; Sunao Okamoto, both of Tokyo, and Tamotsu Fujino, Tokorozawa, all of Japan, assignors to Japan Synthetic Paper Company Ltd. and Oriental Photo Industrial Co., Ltd., Tokyo, Japan

Filed May 12, 1970, Ser. No. 36,658
Claims priority, application Japan, May 13, 1969, 44/36721
Int. Cl. G03c 1/76
U.S. Cl. 96—87 R 4 Claims

A copying material for photographic reflection printing and adapted for ultraviolet transmittance printing, in which a light sensitive silver halide emulsion layer is provided on a thermoplastic synthetic paper having a specular gloss of more than 10 percent, an opacity of 70 to 90 percent and an average transmittance of ultraviolet rays in the wave-length range of 320 to 450 mμ of more than 5 percent.

3,709,692

SILVER CHLORIDE MONOCRYSTAL DOPED WITH CADMIUM AND LOW CONCENTRATION OF LEAD

Gunter Haase, Frankfurt, Main, and Erwin Schopper, Koenigstein, Taunus, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 29, 1970, Ser. No. 85,285
Claims priority, application Germany, Nov. 14, 1969, P 19 57 313.8
Int. Cl. G03c 1/28
U.S. Cl. 96—108 3 Claims

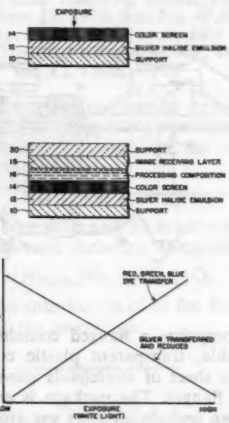
The photographic properties of silver halide monocrystal particle-track detectors which contain cadmium are highly improved by an additional content of lead-II ions.

3,709,693

NOVEL PHOTOGRAPHIC PRODUCTS AND PROCESSES UTILIZING MULTICOLOR ADDITIVE SCREENS WHOSE FILTER UNITS ARE FORMED OF DEVELOPMENT-DIFFUSIBLE DYES

Stanley M. Bloom, Waban, and Leonard C. Farney, Melrose, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed April 26, 1971, Ser. No. 137,487
Int. Cl. G03c 5/54, 7/04, 7/14
U.S. Cl. 96—118 26 Claims



A color image is formed by exposing a photosensitive element having associated therewith an additive color screen, preferably a trichromatic color screen, composed of red, green and blue filter elements containing dyes which provide the required spectral absorption and transmission characteristics and which are diffusible in processing composition as a function of exposure, whereby an imagewise distribution of dyes and complexed silver is transferred by imbibition to an adjacent layer to provide, when viewed by projection, an additive color image.

3,709,694

BEVERAGE FROM PLANTS OF THE GENUS HEMARTHRIA

Gordon B. Killinger, Gainesville, and Clarence F. Beckham, Hawthorne, both of Fla., assignors to The Institute of Food and Agriculture Sciences, University of Florida, Gainsville, Fla.

Filed Jan. 25, 1971, Ser. No. 109,712
Int. Cl. A23l 1/00, 1/28
U.S. Cl. 99—28 10 Claims

Beverages are formed by steeping the leaves or stems of any member of the genus of the Hemarthria plant in dry, fermented, or green form. Alternatively, the leaves or stems are extracted with an organic solvent and the beverage formed by dissolving the dried extract in hot water.

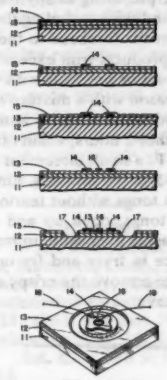
3,709,695

FABRICATION OF SEMICONDUCTOR DEVICES

Ronald R. Bowman, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 528,540, Feb. 18, 1966, abandoned. This application July 16, 1970, Ser. No. 55,579
Int. Cl. G03c 5/00; H01l 5/00, 7/00
U.S. Cl. 96—36.2 2 Claims

A germanium mesa transistor is fabricated having an epitaxially grown base region and an aluminum alloy emitter in the epitaxially grown layer spaced from the collector junction, and having a gold-comprising base electrode surrounding the emitter and closely spaced therefrom. The gold contact is formed by photolithographic and selective etching techniques,



followed by the formation of the aluminum emitter, which is also formed by photolithographic and selective etching techniques. A key step is the selective removal of the aluminum from the germanium wafer without disturbing the gold contact.

ERRATUM

For Class 99—28 see:
Patent No. 3,709,694

3,709,696

TORTILLA AND PROCESS USING HYDROPHILIC INORGANIC GELS

Manuel J. Rubio, Bridgeport, Conn., assignor to Roberto Gonzalez Barrera, Monterrey, N.L., Mexico

Continuation-in-part of Ser. No. 44,584, June 8, 1970, abandoned. This application May 6, 1971, Ser. No. 141,045
Int. Cl. A21d 2/18
U.S. Cl. 99—80 R 9 Claims

To retard the staling of tortillas, which are an unleavened unshortened food product made from nixtamalized corn or corn flour to retard microbiological spoilage, and to increase the yield of dough and tortillas by incorporating hydrophilic inorganic gels in making the tortilla dough.

3,709,697

FURANONE MEAT FLAVOR COMPOSITIONS

Cornelis Nicolaas de Groot, Zevenaar, Netherlands; John S. Hobbs, Rushden, England, and Christiaan Herman Theodoor Tonsbeek, Zevenaar, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed March 20, 1970, Ser. No. 21,496
Claims priority, application Great Britain, March 25, 1969, 15,561/69
Int. Cl. A23l 1/26
U.S. Cl. 99—107 6 Claims

Meaty foodstuff in which the flavor of a meaty product or a meat simulating product is improved by the incorporation of 2,5-diethyl- or 2,5-methyl-ethyl-4-hydroxy-2,3-dihydrofuran-3-one or a precursor of these compounds.

3,709,698

METHOD OF PREPARING CRISPY FOOD ITEMS

Edward E. Davis, 4265 San Francisco, St. Louis, Mo.

Filed Jan. 12, 1970, Ser. No. 2,412
Int. Cl. A22c *18/00*
U.S. Cl. 99—107 6 Claims

This is a method of preparing crispy barbecued snouts or snoots, tripe, pig ears and skins including the steps: cut out the two main tendons from the forehead to the tip of the nose of the snouts, and in all products trim excess fat and cut out all lean meat; cover product or products with water in a pot and boil for 30 minutes; season with a mixture of salt, red pepper, and garlic powder, and while keeping water in and over the products, boil for another 2 hours; strain off the water and fry in deep fat set at 375° F. a small increment at a time to insure floating, substantially 5 to 10 minutes, until snouts are firm enough to handle with tongs without tearing; lift snouts, etc., out individually with tongs, open up and put in a deep fry basket with another basket over them to maintain spread and reduce curling, replace in fryer and fry until crisp, substantially 15 to 20 minutes; remove the crispy snouts, etc., put in barbecue sauce, and serve.

3,709,699

METHOD OF PREPARING A POULTRY PRODUCT

Robert H. Hartman, 10129 Huntington Court, Orland Park, Ill., and Eldon J. Strandline, 6531 North Minnehaha Avenue, Chicago, Ill.

Filed Jan. 25, 1971, Ser. No. 109,685
Int. Cl. A22c *21/00*
U.S. Cl. 99—107 10 Claims

A synthetic poultry skin is formulated by comminuting poultry skin tissue, and mixing the comminuted tissue with a binder material. The synthetic skin formulation is then blended with water to form a paste and applied to poultry meat to give a poultry product having a synthetic skin.

3,709,700

SMOKE FLAVORING BARBECUE ADDITIVE AND METHOD OF MAKING

Sheila W. Ross, 1211 S. Edris Drive, Los Angeles, Calif. 90035

No Drawing. Filed Jan. 29, 1971, Ser. No. 110,663
Int. Cl. C10l *5/00, 9/10*
U.S. Cl. 44—6 12 Claims

A barbecue additive for smoke flavoring meat and other foodstuffs includes a combustible element having smoke producing flavor agents adhesively attached thereto which impart a desired flavor and aroma to the cooked foodstuff.

3,709,701

PRODUCTION OF MIXED CRYSTALS OF SODIUM GLUTAMATE AND SODIUM INOSINATE

Hirotoshi Samejima, Akira Furuya, Keiji Shimaoka, and Yoshiatsu Aoki, Tokyo, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Continuation of abandoned application Ser. No. 628,478, Apr. 4, 1967. This application June 3, 1971, Ser. No. 149,791
Claims priority, application Japan, Apr. 7, 1966, 41/21,496
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 N 4 Claims

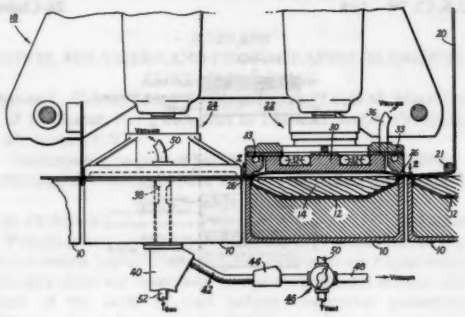
Mixed crystals of sodium glutamate and disodium inosinate are prepared by adding a solution containing both monosodium glutamate and disodium inosinate to a monosodium glutamate mother liquor containing seed crystals of monosodium glutamate, and simultaneously evaporating the resulting mixture to grow mixed crystals of a desired size.

3,709,702

HERMETICALLY SEALED FOOD PACKAGE

Reid A. Mahaffy, Montclair, Joel A. Hamilton, Clifton, and Wesley W. Pinney, Montclair, N.J., assignors to Mahaffy & Harder Engineering Company, Totowa, N.J.

Continuation of application Ser. No. 484,284, Sept. 1, 1965. This application July 22, 1970, Ser. No. 64,035
Int. Cl. B65b *31/02, 25/06*
U.S. Cl. 99—174 7 Claims



Package comprises a flanged container of semi-rigid, gas-impermeable, transparent plastic containing a food product and a sheet of stretchable gas-impermeable film sealed to the flanges. The package is evacuated prior to sealing and can include an inert gas atmosphere. A rigid board is attached to the film at the flange area with a bond stronger than that between the film and container. Apparatus for forming the package includes a first packaging station where the film is sealed around a portion of the flange area by heat seal bars and vacuum means to draw the film interior of the flange toward a heating element interior of the seal bars. Second packaging station includes means to evacuate the package, complete the seal between the film and the container, and a check valve which vents the area above the film while maintaining the vacuum below the container. The atmospheric pressure causes the stretched film to be pressed into tight fitting contact with the upper surface of the food product.

3,709,703

METHOD OF WINDING TUBULAR FILMS OR WEBS AND RESULTING PRODUCT

Frank M. McNeill, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed Dec. 29, 1970, Ser. No. 102,458
Int. Cl. A22c *13/00*; B65d *85/67*
U.S. Cl. 99—176 9 Claims

Flexible tubular material such as tubular films, foils, or webs are inflated or otherwise held in an expanded condition and wound radially inward on a supporting core. The resulting radially wound flexible tubular material is a novel product. The tubular material may be pulled

off or fed from either end of the radially wound material and may be continuously filled by introduction of any desired material through the hollow supporting core or through the radially wound material itself in the event that the core has been removed.

3,709,704

CERAMIC DIELECTRIC MATERIAL COMPRISING BARIUM-SODIUM-NIODIUM TITANATE

Yoshihiro Matsuo, Hiromu Sasaki, and Shigeru Hayakawa, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed June 12, 1970, Ser. No. 45,870
Claims priority, application Japan, July 29, 1969, 44/61,125; Oct. 13, 1969, 44/81,983, 44/81,984
Int. Cl. C04b *33/00*
U.S. Cl. 106—39 R 3 Claims

A ceramic material in a perovskite structure having a high dielectric permittivity, a low power factor and a low temperature coefficient of permittivity, the composition of which is in a chemical formula of

$$Ba(Na_{0.25x}Nb_{0.75x}Ti_{1-x})O_3$$

wherein x ranges from 0.01 to 0.30 in accordance with the inventions. The ceramic dielectric composition of

$$Ba(Na_{0.25x}Nb_{0.75x}Ti_{1-x})O_3$$

can be modified by substitution of Sr for Ba or Li for Na in accordance with the inventions.

3,709,705

OPALIZABLE ALKALINE EARTH ALUMINO-SILICATE GLASS COMPOSITIONS

Erwin C. Hagedorn, Oregon, Ohio, assignor to Owens-Illinois, Inc.

Continuation of application Ser. No. 814,104, Apr. 7, 1969, which is a continuation-in-part of application Ser. No. 653,357, July 14, 1967, both now abandoned. This application Jan. 13, 1971, Ser. No. 106,235
Int. Cl. C03c *3/04*
U.S. Cl. 106—54 6 Claims

A system of thermally opalizable glass compositions comprising SiO_2, Al_2O_3, B_2O_3, Na_2O, CaO and MgO. The above-mentioned compositions can be used to form opal articles having outstanding properties such as low coefficients of thermal expansion and high resistance to thermal shock and chemical attack. The resultant articles, which are converted to opal articles during forming or by subsequent heat treatments, are useful, for instance, as containers including cookware and dinnerware.

3,709,706

REFRACTORY FIBERS AND OTHER ARTICLES OF ZIRCONIA AND SILICA MIXTURES

Harold G. Sowman, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 16, 1969, Ser. No. 825,273
Int. Cl. C04b *35/48*
U.S. Cl. 106—57 14 Claims

Refractory aggregates and shaped articles, such as fibers, films, flakes, and microspheres, of zirconia and silica mixtures, are made by shaping and dehydratively gelling, for example by extruding in air, an aqueous mixture of a zirconium compound, such as zirconium diacetate, and colloidal silica, and heating the resulting gelled body or article in a controlled manner to decompose and volatilize undesired constituents and convert the body to a refractory material or article having a desired microstructure and useful to form refractory fabrics, reinforced composites, heat or sound insulation, filter or adsorption media, fillers, pigments, etc.

3,709,707

ATTRITION RESISTANT GRANULES, METHOD OF MAKING THE SAME AND CEMENTITIOUS GROUT AND CONCRETE COMPOSITIONS CONTAINING THE SAME

Solomon Jacob Rehmar, East Euclid, Ohio, assignor to Construction Techniques, Inc., Cleveland, Ohio

No Drawing. Filed Dec. 14, 1971, Ser. No. 207,997
Int. Cl. C09c *1/64*; C04b *21/02, 31/40*
U.S. Cl. 106—87 9 Claims

Granules containing particles of substantially oxide free aluminum, a water soluble binder and powdered inorganic extender are made resistant to attrition, by contact with cementitious grout and concrete compositions which contain abrasive materials (e.g. sand) by incorporating a low molecular weight polyhydric alcohol in the composition from which the granules are formed.

3,709,708

WAX EMULSIONS

Edward Strazdins, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of applications Ser. No. 500,242, Oct. 21, 1965, and Ser. No. 667,373, Sept. 13, 1967. This application Feb. 16, 1970, Ser. No. 11,779
Int. Cl. C08h *9/10*
U.S. Cl. 106—216 10 Claims

The manufacture of an anionic wax size emulsion concentrate which contains an anionic colloid protector by adding a small amount of an aqueous solution of a water-soluble salt of a polyvalent metal which forms an insoluble hydroxide within the range of 2 to 10, before, during or after the emulsification step, and then precipitating at least a part of the metal of the added salt as a salt with said protective colloid.

3,709,709

KAOLIN DERIVED PIGMENTS AND METHODS OF PRODUCING THE SAME

Andrew Torok, and Thomas F. Walsh, both of Pursippany, N.J., assignors to Georgia Kaolin Company

Filed Oct. 28, 1970, Ser. No. 84,895
Int. Cl. C08h *17/06*
U.S. Cl. 106—288 B 7 Claims

Novel white pigments are produced through controlled extraction of alumina from kaolin by means of an ammonium sulfate or bisulfate leaching process, removal by water of the ammonium aluminum sulfate formed and recovering the insoluble residue. Other novel pigments are produced by subjecting the recovered insoluble residue to calcination in temperature range of 500°–1,100° C. The pigments produced according to the invention have a lower specific gravity than kaolin and/or calcined kaolin and exhibit a greatly improved brightness and whiteness.

3,709,710

TITANIUM DIOXIDE PIGMENTS USEFUL IN DELUSTRING OF POLYAMIDES

Owen Burchell Edgar, Hexagon House, Blackley, Manchester, England; William Hughes, 77 Junction Road, Norton, England; Derek R. Lawrance, 40 Belgrave Road, Abergavenny, England; Gerald Lederer, 1 Dunedin Ave., Hartburn, Stockton-on-Tees, England; and Colin Foster Ritchie, Hexagon House, Blackley, Manchester, England

No Drawing. Original application Nov. 20, 1967, Ser. No. 684,542. Divided and this application Sept. 2, 1970, Ser. No. 69,183
Claims priority, application Great Britain, Nov. 25, 1966, 52,828/66
Int. Cl. C09c *1/36, 3/00*
U.S. Cl. 106—300 5 Claims

Polyamide compositions comprising a synthetic linear fibre-forming polyamide, a delustring agent (especially titanium dioxide), a manganese compound and an antimony compound, and optionally a copper compound and

a halide, or a phenol and hypophosphorous acid or a salt thereof; processes for their manufacture; and titanium dioxide pigments suitable for use in their manufacture containing chemically combined antimony and having a coating containing chemically combined manganese.

3,709,711

METHOD OF CAULKING OR STOPPING UP CREVICES OR FILLING UP JOINTS AND THE LIKE IN BUILDINGS

Tage Raymond Holmstrom, Bragevagen 3, Sodertalje, Sweden

No Drawing. Continuation-in-part of abandoned application Ser. No. 702,808, Feb. 5, 1968. This application Feb. 18, 1971, Ser. No. 116,652

Claims priority, application Sweden, Feb. 7, 1967, 1,714/67

Int. Cl. B32b *3/02*

U.S. Cl. 117—2 R **5 Claims**

This invention refers to a method of caulking or stopping up crevices or filling up joints and the like in buildings, such as between window frames and walls. A fine grained, porous material having a closed cellular structure and a low liquid absorbing ability, such as cork crumbs or the like, is mixed with a bonding agent and the mass is injected into the crevices or joints so as substantially to fill up same, and is allowed to solidify into a deformable, coherent mass adhering to the building material which bounds the crevices.

3,709,712

PROCESS OF SEALING LEAKS

Joseph Rossman, deceased, Philadelphia, Pa. (by Provident National Bank, executor), assignor to Joseph J. Packo, Fort Lauderdale, Fla.

Filed Jan. 6, 1971, Ser. No. 104,458

Int. Cl. B23p *7/04, 7/00*

U.S. Cl. 117—2 R **7 Claims**

Leaks in pipelines, conduits, tanks, vessels and the like are sealed by introducing ammonia gas under pressure into such equipment which will escape through any existing leaks and react with an aqueous metal salt solution supplied at the external site of the leak to form a solid reaction product which seals the leak. Ammonia gas admixed with carbon dioxide gas may also be used in this process to produce complex solid reaction products for sealing leaks.

3,709,713

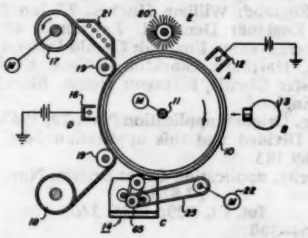
METHOD FOR MAGNETIC DEVELOPMENT

Lyman H. Turner, Pittsford, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Original application Aug. 7, 1968, Ser. No. 750,851. Divided and this application June 15, 1970, Ser. No. 57,428

Int. Cl. G03g *13/00*

U.S. Cl. 117—17.5 **1 Claim**



This invention is an improved method of rapidly starting and stopping magnetic development of a latent electrostatic image carried on a moving photoconductive member wherein a magnet in close proximity to the photoconductive member produces a magnetic flux field directed toward the image bearing photoconductive member which magnet is enclosed in an application roll transporting the magnetizable developer material into the magnetic flux field directed between the magnet and the photoconductive member. The applicator roll is rotated to carry the developer toward the magnetic flux field produced by the magnet oriented in a first position to form a magnetic brush contacting and developing a latent image. The magnet is pivotally displaced to a second position in which the magnetic flux field is directed away from the latent image. Development ceases and the applicator roll is immediately stopped.

3,709,714

METALIZING SUBSTRATES

Sung Ki Lee, Niagara Falls, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 750,487, Aug. 6, 1968, now Patent No. 3,617,320. This application Dec. 31, 1970, Ser. No. 103,280

Int. Cl. B44d *1/092, 1/52*

U.S. Cl. 117—47 A **11 Claims**

There is provided a two-phase bath for metalizing substrates which comprises a first phase comprising phosphorus in a solvent, and multi-purpose agent, and a second phase comprising a metal salt or complex thereof and multi-purpose agent, wherein said multi-purpose agent is selected from the group consisting of cellulose derivatives, vinyl polymers and copolymers, acrylic polymers, novolacs, oxyalkylated novolacs, oxyalkylated aniline novolacs, oxyalkylated polyols, glycols, polyglycols, siloxanes, natural rosins and gums, and mixtures thereof, The multi-purpose agent serves as viscosity modifier, surface and interfacial tension controller, film former and surfactant.

3,709,715

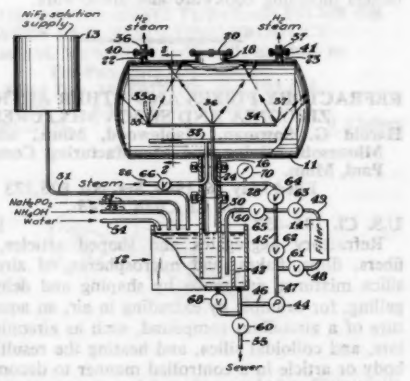
ELECTROLESS NICKEL PLATING OF HOLLOW CONTAINERS

Alvin M. Edmunds and Russell H. Fay, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 554,026, May 31, 1966. This application Aug. 5, 1969, Ser. No. 859,227

Int. Cl. B44d *1/34;* **C23c** *3/02*

U.S. Cl. 117—50 **15 Claims**



Catalytic metal surfaces are nickel plated from a cation-hypophosphite anion solution. Plating is accomplished by spraying the reactive solutions on the metal surface and heating the surface as by contacting it with steam. Plating

solution is recovered, adjusted in pH as necessary to assure satisfactory plating and recycled.

3,709,716

WET FIXATION OF MODIFYING AGENTS ON FIBROUS SYSTEMS BY HEATING IN AQUEOUS SALT SOLUTION

Robert W. Liggett, Mountain Brook, Ala., assignor to Cotton Producers Institute, Memphis, Tenn.

No Drawing. Filed June 17, 1969, Ser. No. 834,171
Int. Cl. D06m *15/54*
U.S. Cl. 117—63 9 Claims

Modifying agents such as creaseproofing precondensates or dyes, are wet fixed in a water-swellable fibrous system or web such as a cellulose-containing fabric by applying an aqueous solution containing one or more such agents of the desired type to the web and thereafter fixing such agents in the wet web by immersing it in a hot aqueous salt solution which contains a water soluble stable salt of a strong acid which does not decompose in water, such as sodium sulfate. This wet fixation technique is useful in imparting dimensional stability to cellulosic webs such as cotton fabrics or paper, or in otherwise modifying their physical or chemical properties, e.g., in dyeing them. The salt solution serves to prevent or minimize migration of the treating agent from the fibers during a finishing operation.

3,709,717

CERAMIC COATED ARTICLES

Bernard H. Hamling, Warwick, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed May 11, 1970, Ser. No. 36,443
Int. Cl. C23d *13/00*
U.S. Cl. 117—70 C 34 Claims

Ceramic coated articles are prepared which comprise metal articles coated with zirconia wherein the bond between the metal and the zirconia is effected by porcelain enamel. The ceramic coated articles are prepared by contacting zirconia with a metal article coated with porcelain enamel, fusing the porcelain enamel while maintaining contact between the zirconia and the porcelain, and then solidifying the porcelain. The ceramic coated articles of the invention have enhanced utility in hot and/or corrosive environments.

3,709,718

GRAFT POLYMERIZATION PRODUCTS AND PROCESSES

Eckehard Schamberg, Wallisellen, Zurich, and Juerg Hoigné, Zurich, Switzerland, assignors to Inrescor A.G., Schwerzenbach, Switzerland

No Drawing. Filed Dec. 4, 1970, Ser. No. 95,368
Claims priority, application Switzerland, Dec. 12, 1969, 18,491/69; Apr. 21, 1970, 5,910/70
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 12 Claims

Processes for grafting polymerizable materials onto sheets of high polymer which comprise irradiating at least one surface of such a sheet while it is in contact with a belt impregnated with a radical-polymerizable substance at a temperature in the second-order transition range of the sheet; as well as products obtained thereby.

3,709,719

PROCESS FOR POLYMERIZING IMPREGNATED MONOMER AND MATERIAL PREPARED THEREBY

Martin A. Welt, Rego Park, N.Y., assignor to Radiation Technology, Inc., Long Island, N.Y.

No Drawing. Filed Aug. 15, 1969, Ser. No. 850,621
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 4 Claims

A process for producing materials having improved mechanical properties and an esthetically appealing appearance includes impregnating a subject masonry material with a radiation polymerizable monomer, and subsequentially polymerizing the monomer by irradiation.

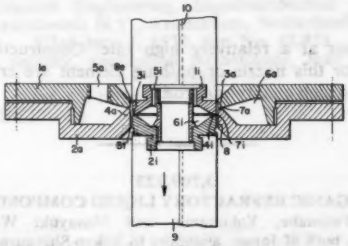
In accordance with one aspect of the invention, the impregnation is effected by drawing the monomer into and about the subject material in a vacuum chamber. The chamber and its contents are then exposed to gamma radiation of controlled dosage such that the monomer impregnated within the masonry material polymerizes, while the monomer bath does not.

3,709,720

PROCESS AND APPARATUS FOR COATING A TUBE OF FIBER MATERIAL WITH VISCOSE BY EXTRUSION

Erwin Kindl, Weinfeldstrasse 17, Wiesbaden-Biebrich, Germany, and Gunter Gerigk, Wintersteinstrasse 6, Oberursel, Germany

Filed Dec. 23, 1970, Ser. No. 100,916
Claims priority, application Germany, Dec. 27, 1969, P 19 65 130.0
Int. Cl. B44d *1/16*
U.S. Cl. 117—95 3 Claims



This invention relates to a process and apparatus for the continuous coating of a tube of fiber material with viscose, the process comprising conveying the tube so that its wall traverses a cylindrical zone of a width of 0.3 to 1.0 mm. defined by external and internal elements, and in its progress through said zone is coated with viscose first on the exterior and then on the interior thereof.

3,709,721

HEAT AND ABRASION RESISTANT TEXTILES

James Ping King, Lansdale, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Filed Sept. 14, 1970, Ser. No. 72,226
Int. Cl. B44d *1/08, 1/02*
U.S. Cl. 117—104 R 7 Claims

A textile (such as a fiber or fabric) of high abrasion and heat resistance and high fold endurance is provided by a structure comprising a high melting textile substrate (such as glass) bearing a coating of polytetrafluoroethylene (PTFE) which coating contains from about 1% to about 30% by weight based on the said coating of a hard, water insoluble, particulate filler of one to 75 microns diameter.

3,709,722

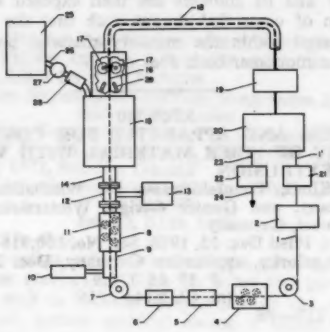
PROCESS FOR ACCRETING MOLTEN COPPER ON A MOVING CORE MEMBER

Donald A. Corrigan, Marblehead, and Italo S. Servi and Chih-Chung Wang, Lexington, Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Original application Apr. 6, 1970, Ser. No. 25,770, now Patent No. 3,610,204. Divided and this application Apr. 7, 1971, Ser. No. 132,227
Int. Cl. C23c *1/00*
U.S. Cl. 117—114 R 2 Claims

This patent relates to an improvement in the continuous casting dip forming process. In the dip forming process

for making wire rod a core member is passed upwardly through a crucible containing a molten metal. The crucible contains a nozzle or bushing through which the core member passes at a relatively high rate. Construction materials for this nozzle or bushing element are critical in obtaining high quality wire rod.



3,709,723

INORGANIC REFRACTORY LIQUID COMPOSITION

Ryuji Watanabe, Yokohama, and Masayuki Watanabe, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 29, 1970, Ser. No. 76,629
Claims priority, application Japan, Oct. 1, 1969, 44/77797; Dec. 26, 1969, 44/104365; Dec. 26, 1969, 44/104367
Int. Cl. C03c *17/22*; C23f *7/00*
U.S. Cl. 117—124 A 10 Claims

The present invention provides a process for preparing (i) inorganic refractory liquid compositions comprising a metal nitride and phosphoric acid or ammonium salts of phosphoric acid as main constituents, and (ii) a method of forming a phosphate of said metal by the reaction of said compositions at temperatures below 150°C after applying said inorganic compositions to a prescribed material.

3,709,724

PROCESS FOR FINISHING LEATHER AND SYNTHETIC LEATHER SUBSTITUTES

Guenter Eckert and Heinrich Hartman, Limburgerhof, Matthias Marx, Bad Duerkheim, and Lothar Wuertele, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Sept. 18, 1969, Ser. No. 859,174
Int. Cl. B44d *1/32*
U.S. Cl. 117—142 9 Claims

Finishing leather and synthetic leather substitutes with a solution in an inert organic solvent of: (I) copolymers containing hydroxyl groups of ethylenically unsaturated copolymerizable compounds containing hydroxyl groups and comonomers with contain groups which are inert to isocyanate groups; and (II) high molecular weight polyisocyanates derived from 2,4-toluylene diisocyanate and containing cyanurate rings and toluylene groups. During and after evaporation of the solvent the components (I) and (II) crosslink at room temperature in ten to twenty minutes. The leather finish obtained is substantially resistant to abrasion, impact and scratching and is substantially less susceptible to solvents than prior art leather finishes.

3,709,725

PROCESS OF PRODUCING TEXTILE GOODS COATED WITH FOAMED POLYVINYL CHLORIDE

Joachim Schabel and Hans-Peter Liebegott, Bremen, Germany, assignors to DS-Chemie GmbH & Co. KG, Bremen, Germany

No Drawing. Filed June 11, 1970, Ser. No. 45,583
Claims priority, application Germany, May 14, 1970, P 20 23 742.7
Int. Cl. C08f *47/08*; C08g *22/44*
U.S. Cl. 117—161 UF 7 Claims

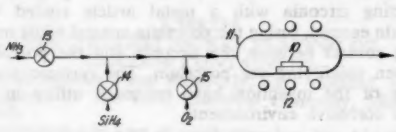
There is provided a process for producing textile goods (especially rugs and carpets) which are coated on the reverse side with foamed polyvinyl chloride. In this process stabilised polyvinylchloride paste containing plasticiser and provided with filler is applied on the textile goods on one side and is gelled by heating. There is added to the polyvinylchloride paste a compound which is stable per se and which is capable of taking up electrons, together with a peroxide compound which is capable of reacting with the paste at approximately room temperature.

3,709,726

SEMICONDUCTOR DEVICES

Roy Nuttall, Cheadle, England, assignor to Ferranti, Limited, Hollinwood, Lancashire, England

Filed Jan. 6, 1970, Ser. No. 919
Claims priority, application Great Britain, Jan. 9, 1969, 1,454/69
Int. Cl. C23c *11/00*
U.S. Cl. 117—201 7 Claims



A pyrolysis method of producing an electrically-insulating layer of silicon oxynitride on a semiconductor device includes the step of heating the device in an atmosphere containing ammonia, silane and oxygen at a temperature between 300° C. and 600° C.

3,709,727

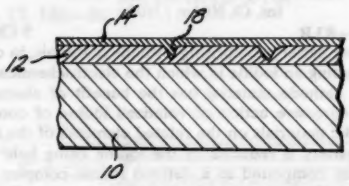
METALIZING SUBSTRATES

George T. Miller, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 785,796, Dec. 20, 1968. This application Apr. 30, 1971, Ser. No. 139,253
Int. Cl. B44d *1/20*; C23c *3/02*
U.S. Cl. 117—213 16 Claims

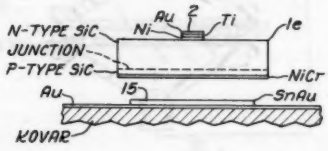
An improvement in the conductivity of substrates, particularly thermoplastic resins and polymers, which are plated with metals by pre-treatment of the substrate with phosphorus and/or low oxidation state phosphorus compounds usually in an organic solvent to deposit phosphorus and/or phosphorus compounds at the surface, followed by contacting the treated substrate with a metal salt or complex thereof, is produced by the addition of cesium to the metal salt or complex thereof. The resulting treated substrate can be readily chemically plated and/or electroplated by conventional techniques.

3,709,728
MULTIPLE LAYER LIMITED DIELECTRIC RECORDING BLANK FOR PULSE PRINTING
Nils T. Anderson, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.
Filed Sept. 25, 1970, Ser. No. 75,377
Int. Cl. B44d 1/18
U.S. Cl. 117—218 6 Claims



A record blank of limited dielectric properties for electrographic pulse printing. The blank has an underlying first dielectric coating and an overlying second dielectric coating over a relatively conductive paper substrate, with the surface resistivity exhibited by such coatings in the blank ranging from 10^8 to 10^{11} ohms per square. A method of preparing the blank from aqueous systems of dielectric coating material.

3,709,729
METHOD OF MAKING NICKEL-CHROME OHMIC CONTACT TO P-TYPE SILICON CARBIDE
John W. Hall II, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Original application July 22, 1969, Ser. No. 843,313. Divided and this application Jan. 20, 1971, Ser. No. 108,217
Int. Cl. B44d 1/18
U.S. Cl. 117—227 4 Claims

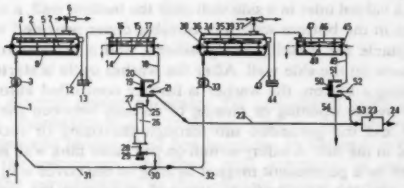


Ohmic contact is made to p-type silicon carbide by depositing a film of nickel, chromium or nickel-chrome thereon while heating the silicon carbide at a temperature of about 600° to 800° C.

3,709,730
MAGNETIC COATING OF IRON SURFACE
Kenkichi Tsukamoto, 462–1 Oaza-Taki, Fujiwara-machi, Shioya-gun, Tochigi-ken, Japan
No Drawing. Filed Oct. 14, 1968, Ser. No. 767,521
Claims priority, application Japan, Oct. 21, 1967, 42/67,618
Int. Cl. B44d 1/02
U.S. Cl. 117—238 15 Claims

A method of inhibiting corrosion of and imparting corrosion resistance to a surface of an iron article by forming a magnetized coating upon the surface thereof either through exposure of that surface to a magnetization treatment directly without any pre-treatment for removal of the oxide film from the surface thereof or such exposure after pickling of the surface. The magnetization treatment can involve exposure to a magnetic field, or the application of a coating of a magnetized material including a material having strong magnetic susceptibility. The magnetized material can be applied to the surface as a coating prior to pickling or subsequent to pickling of the surface and the coating mixture can consist of one or several magnetized highly magnetically susceptible materials, or a mixture of such materials and at least one weakly or non-magnetically susceptible material; and, also may consist of a magnetized material alone or mixed with a weakly or non-magnetically susceptible material, when also mixed in a carrier vehicle.

3,709,731
PRODUCTION OF CRYSTALLINE DEXTROSE MONOHYDRATE
Wouter G. Kingma, Huizen, Netherlands, assignor to Continental Engineering, Ingenieursbureau voor de Procesindustrie N.V., Amsterdam, Netherlands
Filed June 1, 1970, Ser. No. 42,031
Claims priority, application Netherlands, June 5, 1969, 6908590
Int. Cl. B01d 9/02; C13f 1/00, 1/02
U.S. Cl. 127—58 8 Claims



A process for the production of crystalline dextrose monohydrate, wherein a dextrose mass which initially comprises mainly a concentrated dextrose solution is continuously passed in prop flow through an elongated horizontal crystallization zone to effect crystal formation and then through an ageing zone to effect crystal growth, whereupon the dextrose mass is separated into crystals and mother liquor and the mother liquor is concentrated and subjected again to crystallization and ageing. A vacuum is created above the dextrose mass flowing through the crystallization zone so as to cause a temperature fall therein by self-evaporation and to effect crystal formation. At the same time, the mass in the crystallization zone is stirred in planes perpendicular to its direction of flow and substantially no heat is supplied from the outside. Crystal growth within the ageing zone is effected at constant temperature and atmospheric pressure. The concentrated mother liquor may be worked up by blending part of it with initial dextrose solution and recycling it to the beginning of the process or by subjecting at least part of it to a second cycle of operations comprising passing the concentrated mother liquor through a second crystallization zone and a second ageing zone and separating the resulting mass into a second portion of crystals and a second mother liquor. The second portion of crystals may be combined with crystals resulting from the

first cycle of operations or recovered separately or blended with an initial dextrose solution and recycled to the beginning of the process.

3,709,732

ULTRASONIC DISHWASHER

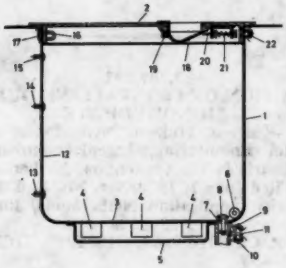
Max Thomen, 67 Ruebisbachstrasse, 8202 Kloten, Switzerland

Filed Aug. 12, 1971, Ser. No. 171,094

Claims priority, application Switzerland, Aug. 18, 1970, 12422/71

Int. Cl. B08b 3/10

U.S. Cl. 134—57 D 6 Claims



Piezoelectric transducers are attached to the bottom wall of an upwardly open tub of austenitic stainless steel equipped with a valved inlet in a side wall near the bottom wall, a valved outlet in the bottom wall, a removable cover provided with a receptacle for washing compositions, and a vertical row of contacts on the side wall. After the washer cycle is started by pressing a button, the washer is further controlled automatically by the opening or closing of circuits between the contacts and the grounded tub through the rising or receding liquid in the tub. A safety switch on the outer tank wall is kept closed by a permanent magnet as long as the cover is in position, and the receptacle is dropped to release the washing composition upon retraction of a latch by an electromagnet on the outer face of the tub side wall.

3,709,733

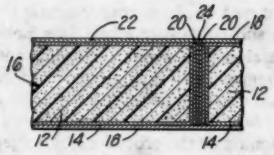
COMPOSITE PANEL STRUCTURE HAVING MOUNTING INSERTS THEREIN

Steven E. Mautner, Beverly Hills, Calif., assignor to Craig Systems Corporation, Lawrence, Mass.

Filed June 26, 1970, Ser. No. 50,045

Int. Cl. E04c 2/10, 2/26

U.S. Cl. 161—37 1 Claim



A composite panel structure comprising rigid foam slabs each enclosed by a jacket bonded thereto, the jacketed slabs being arranged side by side in edge-abutting relation to form a core. Outer skins are bounded to opposite sides of the core. Mounting inserts are potted in cavities in the core wherever required.

3,709,734

CATHODES FOR SOLID ELECTROLYTE CELLS

Charles C. Liang, Andover, Mass., and Carl R. Schlaikjer, Arlington, Mass., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Feb. 9, 1971, Ser. No. 113,989

Int. Cl. H01m 15/00

U.S. Cl. 136—83 R 9 Claims

A solid state battery comprising cathode materials, in composition including an iodide in which the electrochemical activity of the cathode material has the benefit of elemental iodine. The corrosive action of volatized iodine of conventional cathodic materials on the related elements of the solid electrolyte battery is reduced by the iodine being held in a solid chemical compound as a defined iodine complex and further reduced by the use of a lead dioxide current collector, which neither reacts with nor absorbs the active component of the cathode, thus isolating other battery components from the chemical action of iodine by preventing absorption and subsequent diffusion of iodine vapor from the cathode mixture.

3,709,735

ELECTROCHEMICAL GENERATOR WITH DISPERSE CARBON ELECTRODE

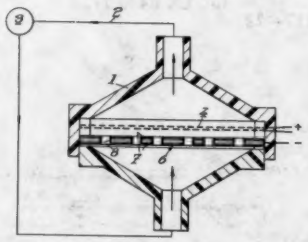
Maurice G. Bonnemay, Boulogne, Guy R. Bronoel, Versailles, and Denis Doniat, Le Perreux, France, assignors to Agence Nationale de Valorisation de la Recherche (Anvar), Puteaux, France

Filed Feb. 3, 1970, Ser. No. 8,328

Claims priority, application France, Feb. 4, 1969, 6902377

Int. Cl. H01m 29/04

U.S. Cl. 136—86 A 11 Claims



The electrochemical generator has at least one electrochemical storage means having a rechargeable electrode whose active material is constituted by active carbon powder suspension in a liquid electrolyte. The suspension is circulated in contact with conducting grid elements. Under the effect of a charging voltage applied to the grid elements the electrolyte provides, by electrolytic decomposition, a fuel gas or an oxidising gas according to the sign of the rechargeable electrode. The compact electrode may be covered at least in part with a coating of porous polyvinyl chloride, whose pores are permeable to the electrolyte but not to the powdered material. The electrode plates may be of cadmium and the electrolyte of aqueous potassium hydroxide. A branch circuit may be provided for the circulating electrolyte and a reservoir of the powder material and filtration device for the electrolyte so that the disperse electrode may be replenished with fresh material.

3,709,736

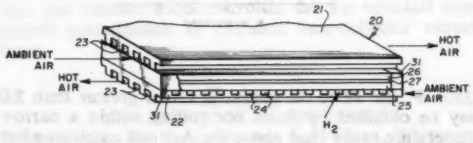
FUEL CELL SYSTEM COMPRISING NON-CIRCULATING, COUNTER-CURRENT GAS FLOW MEANS

Otto J. Adlhart, Newark, and Peter L. Terry, Madison, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Continuation-in-part of application Ser. No. 859,111, Sept. 18, 1969. This application Aug. 17, 1970, Ser. No. 64,319

Int. Cl. H01m *27/00*

U.S. Cl. 136—86 R 10 Claims



In an air-breathing fuel cell stack utilizing a stable acid electrolyte system and electrically and thermally conductive plates between the individual cells, the air sweep simultaneously supplies oxidant and maintains the temperature and water balance in the cell. The triple function control by air flow is made possible by virtue of a combination of the particular type of electrolyte and by an improved arrangement of air feed to the cells.

3,709,737

LEAKPROOF BATTERY AND METHOD OF MANUFACTURING THE SAME

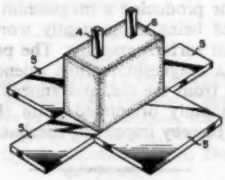
Tadasu Fujimoto; Kotofusa Kuroda, and Akira Yamamoto, all of Takatsuki, Japan, assignors to Yuasa Battery Company, Limited, Takatsuki, Osaka Prefecture, Japan

Filed Sept. 30, 1970, Ser. No. 76,902

Claims priority, application Japan, April 24, 1970, 45/35820; April 24, 1970, 45/35821; April 24, 1970, 45/35822

Int. Cl. H01m *3/02*, *9/02*

U.S. Cl. 136—148 4 Claims



This invention relates to a method of manufacturing a leakproof battery, the battery being of the construction in which a composition of a mixture of hydrated silica gel with thermoplastic synthetic resin is placed around a plate group, heated in saturated steam above 100°C and solidified into a liquid absorbable porous body integral with the plate group, and the liquid absorbable porous body is impregnated with an electrolyte and mounted in a battery container. Alternatively, the battery container itself can be used as the mold.

3,709,738

METHOD OF MAKING A BATTERY SEPARATOR FROM A WEB OF NON-WOVEN POLYMERIC FIBERS

Thomas J. Wetherell, New York, N.Y., assignor to High Energy Processing Corporation, New Bedford, Mass.

No Drawing. Original application Jan. 24, 1969, Ser. No. 793,894. Divided and this application July 6, 1971, Ser. No. 160,130

Int. Cl. H01m *3/00*

U.S. Cl. 136—148 2 Claims

A method of making a battery separator for alkaline storage batteries of the non-woven fiber mat type; the fiber mat being impregnated with a polymeric binder and a monomeric wetting agent, the thus impregnated mat being subjected to irradiation to form a cross-linked unitary structure.

3,709,739

ELECTRIC POWER GENERATOR

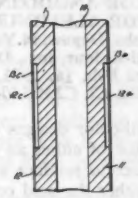
Alan David Webb, 44 Heathside, Hinchley Wood, England

Continuation-in-part of application Ser. No. 804,615, Mar. 5, 1969. This application Dec. 21, 1971, Ser. No. 210,460

Claims priority, application Great Britain, Mar. 7, 1968, 11,107/68

Int. Cl. H01v *1/02*

U.S. Cl. 136—208 6 Claims



An electric power generator for petroleum wells comprises thermocouples connected into a series/parallel arrangement having their hot junctions in thermal contact with the petroleum and their cold junctions in contact with the surroundings so that electric power is generated by the Seebeck effect.

3,709,740

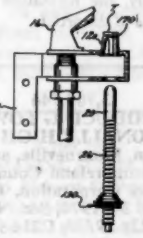
THERMOCOUPLE

Fred V. Kenyon, Anaheim, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 705,767, Feb. 15, 1968, Pat. No. 3,650,843, which is a continuation-in-part of Ser. No. 651,570, July 6, 1967, Pat. No. 3,522,107. This application Oct. 29, 1971, Ser. No. 193,695

Int. Cl. H01v *1/02*

U.S. Cl. 136—217 5 Claims



A thermocouple which may be attached to any type of support bracket, has a mounting portion and a pair of adaptors

thereon in spaced relation to each other with each adaptor having a resilient element cooperating with the mounting portion to enable initial slip-on positioning of the two adaptors which may be finally moved into clamping positions relative to the support bracket.

3,709,741
IMPURITY PATTERNS PRODUCED BY ION IMPLANTATION

Walter Maxwell Gibson, Basking Ridge, N.J., and Andrew Rhodes Hutson, Summit, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Sept. 9, 1970, Ser. No. 70,698
Int. Cl. H01l *3/00, 7/54*
U.S. Cl. 148—1.5 2 Claims

Stripe or spot patterns of impurities or dopants on a very fine scale are produced in solid surfaces by high energy ion bombardment through at least one thin screening crystal. The ions are channeled through the screening crystal and interact with the next crystal to produce a moire pattern of the bombarding ions at the surface of a substrate. The substrate can be the second crystal or a third solid body intercepting the beam emerging from a thin second crystal.

3,709,742
MULTI-COLOR ANODIZING PROCESS FOR ALUMINUM

John J. Jacobs, Depew, N.Y., assignor to Re Jo Multi-Colour, Inc., Depew, N.Y.

No Drawing. Filed Feb. 16, 1971, Ser. No. 115,836
Int. Cl. C23f *5/04*
U.S. Cl. 148—6.1 5 Claims

In producing multi-color designs on an anodized aluminum, a first solution of either an acid or a base is applied to a dyed surface to produce a color change, and a second solution of either the acid or base not previously used, is applied to a portion of the already treated surface to produce another color change.

3,709,743
ACIDIC DEPOSITION PROCESS

Jerry Owen Dalton, and Richard Byrd Graver, both of Louisville, Ky., assignors to Celanese Coatings Company, New York, N.Y.

Continuation-in-part of Ser. No. 880,914, Nov. 28, 1969, abandoned. This application June 16, 1971, Ser. No. 153,847
Int. Cl. C23f *7/00*; B44d *1/098*
U.S. Cl. 148—6.2 11 Claims

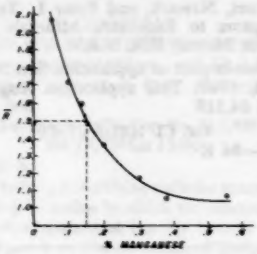
A metallic article is coated with an adherent polymer film by contacting the metallic article with an aqueous bath containing an anionic surfactant stabilized emulsion of a synthetic resinous film forming composition and an oxidizing acid. Interaction of the oxidizing acid and the metallic article produces ions at the surface of the article which ions in turn cause coagulation of the emulsion polymer at the bath-article interface and, thereby, the formation of a coating of the polymer on the surface of the article.

3,709,744
METHOD FOR PRODUCING LOW CARBON STEEL WITH EXCEPTIONALLY HIGH DRAWABILITY

Stephen R. Goodman, Monroeville, and Hsun Hu, Franklin Township, Westmoreland County, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 27, 1970, Ser. No. 15,018
Int. Cl. C22c *39/30*; C21d *9/48, 7/14*
U.S. Cl. 148—12 10 Claims

A sheet steel with exceptionally high drawability (R value greater than 1.5) and high yield strength, is produced by adjusting the melt to less than 0.15% Mn, 0.03 to 0.1% C, 0.004 to 0.03% S and less than 150 p.p.m. oxygen. The slab cast from the above melt is then hot rolled, only above the A_3 temperature, cold reduced from 60 to 80% and soaked at temperatures of 1200° F. to

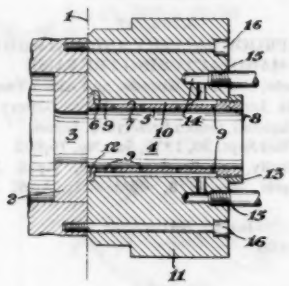


1350° F. for 12 to 30 hours. $\bar{R}$ values greater than 2.0 may be obtained by finish hot rolling within a narrow temperature range (just above the A_3) and employing less than 0.07/ Mn.

3,709,745
THERMAL PROCESS FOR IMPROVING THE MECHANICAL FORMING OF MAGNESIUM ALLOYS

Ronald D. Koeplinger, Saginaw, John F. Pashak, Linwood, and George S. Foerster, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 19, 1970, Ser. No. 81,664
Int. Cl. C22f *1/06*
U.S. Cl. 148—11.5 M 12 Claims



A process for producing a magnesium alloy die extrusion capable of being subsequently worked without incurring incipient surface cracking. The process comprises die extruding a magnesium alloy, quenching the extrusion as it exits from the die, and annealing the extrusion to provide randomly orientated grain structure at least at the surface, thereby improving mechanical workability.

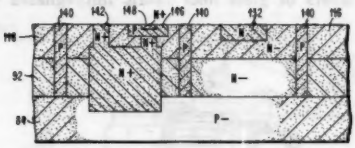
3,709,746
DOUBLE EPITAXIAL METHOD OF FABRICATING A PEDESTAL TRANSISTOR

David De Witt, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,013
Int. Cl. H01l *7/36, 19/00*
U.S. Cl. 148—175 5 Claims

A double epitaxial process for forming a pedestal transistor comprising the steps of providing a substrate of a first conductivity type and then forming first and second opposite conductivity type epitaxial layers thereover. During the growth of the epitaxial layers, selected

out-diffusions from the epitaxial layers form a buried subcollector and pedestal collector region. Diffused isolation regions and base and emitter regions are formed



to complete the device in monolithic form. Precise thickness and concentration control in the top epitaxial layer affords optimization of extrinsic base-collector capacitance.

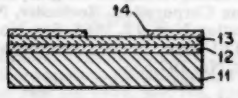
3,709,747
METALLIZED FUEL EMULSION
James Nixon, Westfield, Thomas J. Wallace, Whippany, and Alan Beerbower, Westfield, N.J., assignors to Esso Research and Engineering Company, Linden, N.J.
No Drawing. Filed June 16, 1969, Ser. No. 833,660
Int. Cl. C06d *5/10*
U.S. Cl. 149—22 **13 Claims**

A stable semi-solid or pseudoplastic fuel containing unusually high amounts, e.g., 70 wt. percent, of a metal such as boron, aluminum, etc., is prepared by incorporating the metal in a non-aqueous or essentially non-aqueous emulsion containing as the dispersed phase a major proportion of a hydrocarbon, e.g., jet fuel, an emulsifier and as the continuous phase a minor proportion of a polar organic liquid such as formamide. Such emulsions are readily pumpable and are useful as fuels in air-breathing rockets.

3,709,748
IONIC INTERHALOGEN OXIDIZING AGENT AND METHOD
Francisco Q. Roberto, Lancaster, Calif., assignor to the United States of America as represented by the Secretary of the Air Force
Filed May 26, 1970, Ser. No. 48,614
Int. Cl. C06b *15/00*
U.S. Cl. 149—109 **6 Claims**

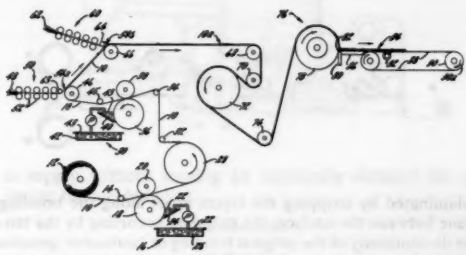
ClF_4PtF_6 is prepared by reacting PtF_6 with ClF_5 in the presence of ultraviolet light. ClF_4PtF_6 is also produced by the reaction and may be removed from the mixture by decomposition. ClF_6PtF_6 is useful as an oxidizing agent and as an intermediate in the preparation of other oxidizing agents containing chlorine in its +7 valence state.

3,709,749
METHOD OF ETCHING INSULATING FILMS
Junzi Sato, Yokohama, and Takako Tanabe, Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Nov. 24, 1970, Ser. No. 92,379
Claims priority, application Japan, Dec. 1, 1969, 44/96,403
Int. Cl. H01l *7/50*; C23f *17/00*
U.S. Cl. 156—11 **1 Claim**



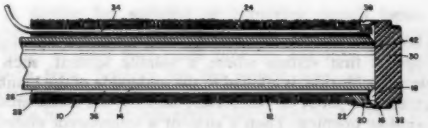
A method of etching insulating film wherein a substrate having a silicon nitride film or a silicon oxide film is dipped in high temperature water of above 100° C.

3,709,750
HIGH PILE PRODUCT
Herman G. Minshell, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Nov. 23, 1970, Ser. No. 91,903
Int. Cl. B32b *5/00*
U.S. Cl. 156—72 **9 Claims**



A high-loft, nonwoven fabric with a gathered sheet material backing layer comprising a web of sheet material with adhesive on each side thereof, the fabric also including a multiplicity of fibers looped outwardly from the backing layer; and a method and apparatus for making the fabric by applying adhesive on a first side of the web of sheet material, embedding a web of fibers in an open pattern of adhesive applied to the opposite side of the web of sheet material, and then gathering the sheet material having the open pattern of adhesive into a gathered sheet material backing layer with a rough uneven undersurface while looping the fibers outwardly from the backing.

3,709,751
PIPE INSULATING METHOD AND APPARATUS
Ronald E. Carlson and Milburn L. Hart, both of 5937 E. Admiral Place, Tulsa, Okla. 74003
Filed Feb. 1, 1971, Ser. No. 111,480
Int. Cl. B32b *5/20, 31/06*
U.S. Cl. 156—78 **14 Claims**

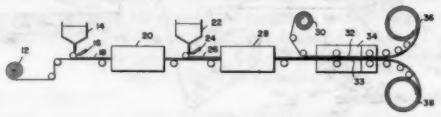


A method and apparatus for applying a foam insulation around the outer periphery of a pipe while simultaneously providing an outer seamless sleeve or jacket around the applied foam insulation. The method and apparatus applies the foam and jacket at the site of the installation of the pipe, such as in a pipe line, or the like.

3,709,752
METHOD OF MAKING SUEDE-LIKE PLASTIC
Reuben Wistozky, and Richard E. Petersen, both of Lowell, Mass., assignors to Pandel-Bradford, Inc., Lowell, Mass.
Continuation of Ser. No. 661,459, Aug. 17, 1967, abandoned. This application Jan. 20, 1971, Ser. No. 108,193
Int. Cl. B32b *5/18, 31/00*
U.S. Cl. 156—79 **30 Claims**

A suede-like plastic material is prepared from a fabric coated with a cellular vinyl chloride resin. The surface of the

resin material is characterized by an undulating or irregular surface which is generally uniformly composed of tensile ruptured cells giving the surface a suede-like appearance approaching that of natural suede leather. The suede material is prepared by the bonding together of surfaces of two resin layers of differing relative tensiles, at least one layer being gelled blowable vinyl chloride resin, which are subsequently heated to form a cellular laminate. The laminate is then



delaminated by stripping the layers apart along the bonding plane between the surface, the stripping occurring by the tensile discontinuity of the original bonding or lamination process thereby imparting a natural suede-like material to at least one delaminated surface of the resin layers.

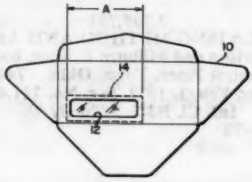
The suede-like surface can also be prepared by forming a temperature gradient across a section of the foam and rupturing the cells.

3,709,753

METHOD OF APPLYING WINDOWS TO ENVELOPES AND BAGS

Gerald A. Taylor, Bergen, N.Y., assignor to Rochester Envelope Company, Rochester, N.Y.

Filed June 25, 1970, Ser. No. 49,652
Int. Cl. B60j 9/00
U.S. Cl. 156—108 7 Claims



A blank for making an envelope with a window opening is fed past a first station where a volatile solvent, such as ethylene trichloride, is applied to the underside of the blank to penetrate and partly or completely saturate the blank around the window opening. Then a strip of a transparent material, such as polystyrene, which is slightly larger than the window opening is pressed onto the blank over the opening. The portion of the strip overlying the blank around the opening is dissolved momentarily by the solvent and adheres completely around the opening. Alternatively, the solvent can be applied after the strips are placed over the window openings. Alcohol may be added to the solvent to increase the speed and depth of penetration of the solvent.

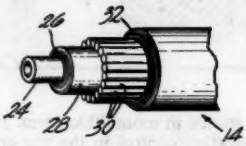
3,709,754

METHOD OF FORMING A CONSTRUCTION MEMBER OF GLASS FIBER ELEMENTS

Albert Medler, Jackson, Mich., assignor to Plastigage Corporation, Jackson, Mich.

Original application Jan. 24, 1968, Ser. No. 700,287, now Patent No. 3,574,104, dated Apr. 6, 1971. Divided and this application Sept. 21, 1970, Ser. No. 74,151
Int. Cl. B31c 9/00; B65h 81/00; F16l 9/16
U.S. Cl. 156—161 2 Claims

The invention pertains to a method for forming a construction member of glass fiber elements impregnated with a hardened resin. The method includes the interposing of elongated, high density, glass fiber rods consisting of a plurality of longitudinally disposed glass fibers bonded together with a hardened binder resin while under tension between layers of glass fiber fabric impregnated with a



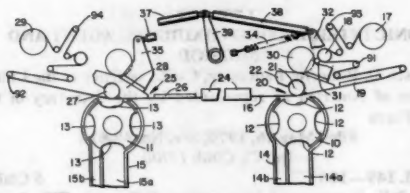
hardenable resin. The resin of the fabric impregnates the interstices between the rods forming a high strength integral, homogeneous, bonded member. The method of the invention is practiced in both the forming of pole and plank type members, and the basic inventive concepts may be practiced in the forming of hollow and solid members.

3,709,755

MULTI-STATION LABELLING METHOD

Fred Joseph Wochner, Holliston, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Sept. 11, 1970, Ser. No. 71,598
Int. Cl. B65c 3/08, 9/06
U.S. Cl. 156—235 8 Claims



Method and apparatus for applying heat transfer labels from a web or backing strip to a bottle or container. The labels which are positioned one after another on the backing strip are applied to the bottles or containers at a plurality of labelling stations such that at first station a first label from a sequence of labels is transferred and at a second station positioned downstream from the first station a subsequent label of the sequence of labels is then transferred.

3,709,756

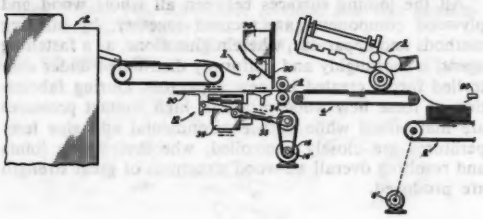
ARTICLE PROCESSING APPARATUS WITH FEEDER SHUTTLE DISCONNECT

Donald W. Watson, Arlington Heights, Ill., assignor to Xerox Corporation, Rochester, N.Y.

Original application Nov. 12, 1968, Ser. No. 774,957, now Patent No. 3,614,088. Divided and this application Jan. 18, 1971, Ser. No. 107,533
Int. Cl. B65c 1/02
U.S. Cl. 156—364 3 Claims

A driving apparatus for shuttle type article feeders, the apparatus including a latch mechanism adapted to couple the shuttle with a reciprocating driving element, abutment means selectively interposed in the path of movement

of the latch mechanism and contactable with an operating arm of the latch mechanism to cause release of the latch mechanism and uncoupling of the shuttle, means



to restrain the shuttle against movement when uncoupled, and control means limiting uncoupling of the shuttle to a predetermined shuttle operating position.

3,709,757

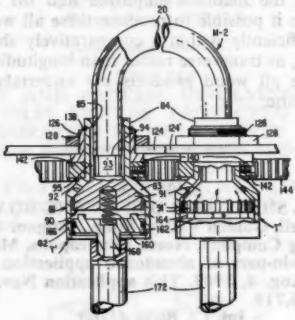
APPARATUS FOR BONDING MATING TUBULAR JOINT MEMBERS

Richard A. Sturley, Kirkville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Original application May 19, 1969, Ser. No. 825,696, now Patent No. 3,636,186. Divided and this application Jan. 18, 1971, Ser. No. 107,597

Int. Cl. B29d *3/00*; B05c *5/00*

U.S. Cl. 156—423 **2 Claims**



The present invention is directed to the bonding of tube joints exemplified by the securement of bell and spigot tube ends on plate fin or spiral fin coil units employed in refrigeration apparatus, the bonding process being characterized in part by accurate metering of a predetermined quantity of a thermosetting structural adhesive to particular locations on the mating tube joint members and productive of an extremely high strength bond therebetween resistive to deterioration after long exposure to normal environmental conditions.

3,709,758

STRAP SEALING TOOL

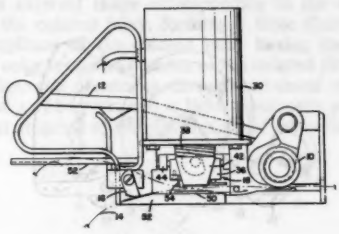
Charles G. Gilmore, Wilmington, Del., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jan. 20, 1971, Ser. No. 108,009

Int. Cl. B32b *31/20*

U.S. Cl. 156—494 **4 Claims**

A tool for friction welding a tensioned loop of plastic strapping is provided with a stationary saw-toothed cutter closely adjacent the welding mechanism. As the strap is moved by the welding mechanism it is rubbed against the saw tooth blade so as to cut the tensioned loop from



a supply without leaving an outwardly directed tab adjacent the welded joint.

3,709,759

DEVICE FOR REPAIRING PUNCH TAPE PROVIDED WITH CODE HOLES AND FEED HOLES

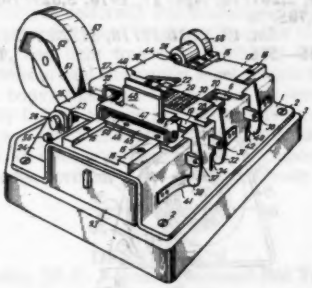
Bohumil Hyca, Vanurova, Czechoslovakia, assignor to Zbrojovka Brno, Narodni podnik, Brno, Czechoslovakia

Filed Feb. 9, 1971, Ser. No. 113,952

Claims priority, application Czechoslovakia, Feb. 12, 1970, 98,170/70; Oct. 10, 1970, 7,136/70

Int. Cl. B31f *5/06*; K03d *15/04*

U.S. Cl. 156—506 **7 Claims**



A device for splicing or repairing punch tapes, and subsequently repunching the splice. The device comprises a base, at least two guide pins for the feed holes of the punch tape, holders for the punch tape on the base, a trimming die of code holes and feed holes of punch tape on the base, a tiltable plate with guide holes for the holes of the trimming die engaging with a hand punch for punching the code holes and at least one punch for punching the feed holes. The trimming die comprises a transverse slot along each side of which at least one row of holes are disposed for punching the code holes and feed holes of the punch tape, while the spacing between both rows of holes placed next to the transverse slot equals the spacing of characters on the punch tape or its full multiple.

3,709,760

MANUAL ADHESIVE TAPE APPLICATOR

Joachim H. Knoner, Bensberg, Germany, assignor to KTC-Uerpackungen, GMBH, Bensberg near Cologne, Germany

Filed Feb. 16, 1971, Ser. No. 115,165

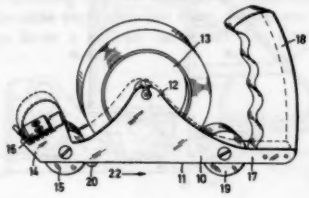
Claims priority, application Germany, Feb. 20, 1970, G 70 06 168.6

Int. Cl. B32b *31/18, 31/20*

U.S. Cl. 156—527 **12 Claims**

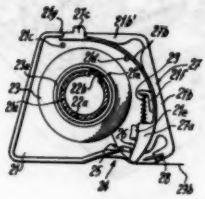
A manual adhesive tape applicator comprises a frame carrying a pressure application roll at one end of its longitudinal

axis, a handle at the other end and a tape supply roll between its ends. The handle projects upwardly from the frame, away from the pressure application roll and, in operation, away from the surface to which the tape is to be applied. The handle



is substantially perpendicular at least at its base portion, to the longitudinal axis of the frame. Above its base portion, the handle may be curved over the frame so that the longitudinal axis of the upper portion of the handle is substantially parallel to the longitudinal axis of the frame.

3,709,761
ADHESIVE TAPE DISPENSERS
Viktor Trueb, Oberhelfenschwil, Switzerland, and Walter Hesener, 66 Rue de la Prulay, Meyrin-Geneva, Switzerland
Filed Feb. 11, 1971, Ser. No. 114,519
Claims priority, application Switzerland, Feb. 16, 1970, 2,206/70, 2,207/70; Apr. 17, 1970, 5,829/70; July 14, 1970, 10,705/70
Int. Cl. B32b *31/18, 31/20*
U.S. Cl. 156—576 **18 Claims**

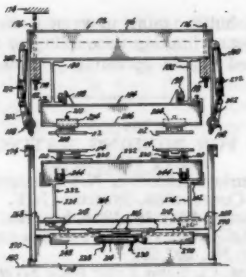


A hand-operated dispenser for adhesive tape comprising a casing adapted for rotatably supporting a roll of adhesive tape, a more or less plane under-surface of the casing adapted to glide over the surface of the article to be taped, an inverted trough-shaped portion on the underside of the casing, located rearwardly with respect to the gliding surface, a slit-shaped opening for the tape in said trough-shaped portion, a bridge piece separating said slit from an opening for the lower end of a movable member adapted with its lower projecting end to impart pressure and a change of direction to the tape, and a knife placed forward of the trough-shaped portion with the knife edge pointing towards but ending above the plane of the under-surface of the case.

3,709,762
PRESS FOR A WOODEN TRUSS
Benson Chandler, P.O. Box 224, Medina, Wash. 98039
Filed Sept. 1, 1970, Ser. No. 68,715
Int. Cl. B32b *31/00*; B30b *1/10*
U.S. Cl. 156—580 **11 Claims**

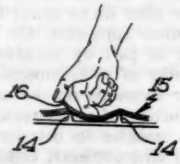
To create and to meet a new wood products market for factory fabricated all wood structural components, such as joists and trusses, new methods and apparatus are made available. Whole wood boards are positioned to include spaces to form an overall contour of a larger structural sub-assembly. Thereafter, their fitted and/or near abutment portions are overlaid first with glue and then with selectively formed and grain orientated plywood reinforcements, which may either in the alternative or in addition be overlaid with glue before their placement.

All the joining surfaces between all whole wood and plywood components are secured together, by utilizing methods and apparatus, wherein glue alone, as a fastening agent, is thoroughly and uniformly distributed under controlled forces created by new apparatus. During fabrication of these new wood products, high contact pressures are maintained while both environmental and glue temperatures are closely controlled, whereby, strong joints and resulting overall all wood structures of great strength are produced.



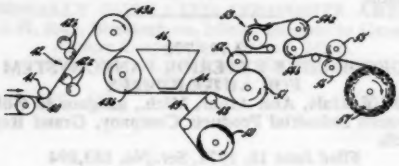
Moreover, the methods employed and the apparatus utilized make it possible to produce these all wood products more efficiently within a comparatively shorter factory building, as transverse rather than longitudinal movements of the all wood products are undertaken during their production.

3,709,763
LABEL SHEET AND DISPENSING BOARD
John E. O'Neil, Golden Valley, Minn., assignor to Meyers Printing Company, North Minneapolis, Minn.
Continuation-in-part of abandoned application Ser. No. 847,128, Aug. 4, 1969. This application Nov. 4, 1970, Ser. No. 86,719
Int. Cl. B65h *41/00*
U.S. Cl. 156—584 **7 Claims**



A printed identification label sheet is pattern coated with adhesive, mounted on a backing sheet and pre-cut to form labels. Each label has a tab portion without adhesive that cooperates with elevational differences on the face of a dispensing board. The tabs pop up when a label is pushed down against the board. The labels may be perforated and divisible to assist in recording which labels have been used and how.

3,709,764
HEAVY-DUTY WIPE AND METHOD FOR PRODUCING SAME
Gordon D. Thomas, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Original application Dec. 23, 1968, Ser. No. 788,987, now Patent No. 3,616,133. Divided and this application May 3, 1971, Ser. No. 139,823
Int. Cl. B32b *5/00*
U.S. Cl. 156—177 9 Claims

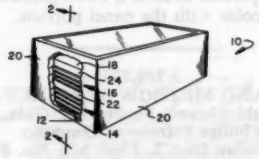


An improved heavy-duty wipe made of non-woven materials, and a method of producing the same. The wipe includes a central layer of multi-ply cellulosic tissue, a web or sheet of open-mesh non-woven crossed threads on each side of the central layer, and a thin applique of fine fibrous material bonded to the outer surface of each crossed-thread web. The central layer of multi-ply cellulosic tissue is bonded to both the warp threads and fill threads on the warp thread side of each of the two webs of non-woven material, and the fibrous appliques are bonded to the fill thread sides of each web.

ERRATUM

For Class 161—37 see:
Patent No. 3,709,733

3,709,765
PRODUCT AND PROCESS INVOLVING OPTICAL THIN FILM FILTERS PROTECTED AGAINST DETERIORATION FROM HUMIDITY
John L. Miles, Belmont, Mass., assignor to Baird-Atomic, Inc., Bedford, Mass.
Filed Nov. 27, 1970, Ser. No. 93,259
Int. Cl. B44f *1/00;* G02b *1/10*
U.S. Cl. 161—1 4 Claims



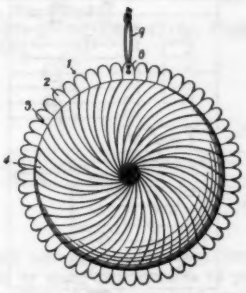
An optical thin film filter having a plurality of alternating high and low index dielectric layers sandwiched between a pair of substrates is protected against impairment from humidity by vapor deposition of a water impermeable metallized film about the exposed edges of the layers and substrates.

3,709,766
DECORATIVE LIGHT DIFFUSING ELEMENT
Norman M. Brody, Los Angeles, Calif., assignor to Norman Industries, Inc., Santa Fe Springs, Calif.
Filed Aug. 17, 1970, Ser. No. 64,533
Int. Cl. B44f *1/00, 7/00*
U.S. Cl. 161—3.5 13 Claims

Lamp element comprising three dimensional plastic colored article, e.g. reproduction of a cartoon character and the like, in the form of a clear transparent polyester cast resin body having a colored fiber glass paper inlay embedded in the resin, such inlay preferably being a silk screened multicolored configuration, the cast resin body having an external shape corresponding to the external shape of the colored inlay, forming a three dimensional plastic duplicate of the colored inlay having the corresponding coloration and outlines of the colored fiber glass paper inlay, and creating a three dimensional effect to the eye of an observer; and a light translucent polyester resin sheet attached to the rear surface of the colored cast

resin body, and preferably extending outwardly therefrom, whereby light from a light source behind such translucent sheet and transmitted diffusely through such sheet to the cast resin body is uniformly transmitted also through such body to light evenly and brightly the entire colored cast resin body, and light transmitted diffusely through the outer portions of said translucent sheet around the colored cast resin body, highlights the colored representation in the brightly lighted colored cast resin body. Preferably, a border area, which may be of decorative design, and formed of an opaque polyester resin, is disposed around the outer edge portions of the translucent resin sheet.

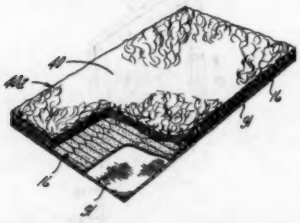
3,709,767
DECORATION
Riki Saiga, 25–1, 3-chome, Asakusabashi Taito-ku, Tokyo, Japan
Filed Apr. 29, 1970, Ser. No. 32,897
Int. Cl. A49g *33/08*
U.S. Cl. 161—14 15 Claims



This decoration is characterized by being formed by forming strips by cutting off such material which can be cut as a paper, cardboard or synthetic resin sheet along straight, curved or wavy lines by leaving slight connecting parts, alternately folding them around the connecting parts as centers, making small holes in the folded strips

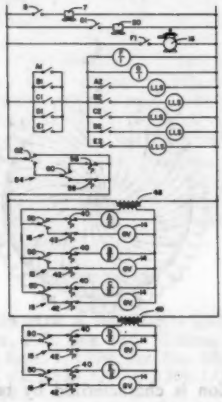
connecting them through rings or strings and developing and fixing the alternately folded parts to have any variations.

3,709,768
HIGH-LOFT, NONWOVEN FABRIC
Robert J. Stumpf, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Continuation-in-part of application Ser. No. 769,959, Oct. 23, 1968. This application Apr. 23, 1970, Ser. No. 31,225
Int. Cl. D04h *11/00*
U.S. Cl. 161—63 28 Claims



A high-loft, nonwoven fabric with a substantially continuous backing layer of adhesive and a multiplicity of fibers looped outwardly from the backing; and a method of making the fabric by first embedding a web of fibers in an open pattern of adhesive and then consolidating the adhesive into a substantially continuous backing layer while looping the fibers outwardly from the backing. In certain instances, the loops may be subsequently shorn, the backing may be stretched or perforated, or the fabric may be laminated to an additional backing or backings to change the final characteristics of the product.

3,709,769
CONTROL FOR AIR-CONDITIONING APPARATUS
Russell E. Wood, East Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Apr. 30, 1971, Ser. No. 139,090
Int. Cl. F24f *3/00*
U.S. Cl. 161—22 4 Claims



A control arrangement for an air-conditioning system adapted to serve a plurality of zones, a master control being provided in the control arrangement to energize and deenergize the zone thermostats, the master control energizing the individual zone thermostats in response to a preselected temperature variation from the zone thermostat set point in a representative zone, deenergization of the zone thermostats by the master control allowing the temperature in each of the zones to increase or decrease from the zone thermostat set point and reduce the load on the air-conditioning system for weekend and nighttime operation.

3,709,770
DECORATIVE EXTERIOR PANEL SYSTEM FOR AUTOMOBILES
Clifford E. Hale, Ann Arbor, Mich., assignor to Gulf + Western Industrial Products Company, Grand Rapids, Mich.
Filed June 16, 1971, Ser. No. 153,894
Int. Cl. B32b *1/04, 3/02*
U.S. Cl. 161—44 23 Claims

Trim panel structures are disclosed of the character adapted to be mounted on the exterior surfaces of vehicle panels such as fender, door, quarter and tailgate panels of a station wagon to provide the vehicle exterior with a wood panel and border appearance. Each trim panel is defined by a sheet of thermoplastic material formed to define integral panel and border portions having decorable outer surfaces. The outer periphery of the trim panel corresponds in contour generally to the outer periphery of the vehicle panel to which it is to be attached, and decorative means is applied to the decorable outer surfaces of the panel and border portions to provide for the panel portion to have a wood panel appearance and to provide for the border portion to have a wood grained appearance contrasting in color with the panel portion.

3,709,771
ARTICLE AND METHOD OF MANUFACTURE
Harold D. Boultinghouse, Bartlesville, Okla., assignor to Phillips Petroleum Company
Original application Dec. 2, 1966, Ser. No. 598,682, now Patent No. 3,580,761, dated May 25, 1971. Divided and this application Apr. 29, 1970, Ser. No. 43,638
Int. Cl. B32b *5/02;* D04h *11/00*
U.S. Cl. 161—67 5 Claims

1. An article comprising a porous backing material having tufts of organothermoplastic material attached thereto,

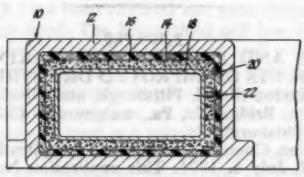
each of said tufts comprising single strands compressed and thermally welded together with other strands at the point of juncture of said tuft and said backing, and said organothermoplastic material being thermally welded to said backing material by said organothermoplastic tuft material dispersed within the porosity of said backing material.

3,709,772

THERMALLY INSULATED COMPOSITE ARTICLE

Hal H. Rice, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 16, 1971, Ser. No. 163,323
Int. Cl. B32b *3/20*
U.S. Cl. 161—139 11 Claims



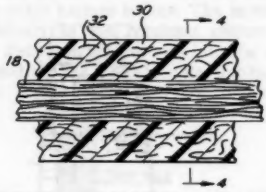
A thermally insulated fluid conducting composite article including a rigid inner core member of erosion resistant material defining a fluid passage and being cushioned from an outer metallic shell by an intermediate layer of resilient material. The core member thermally insulates the outer metal shell from the fluid flowing therethrough while the cushioning layer absorbs shock loads between the core and the shell thereby reducing the possibility of fracture of the somewhat fragile rigid core member.

3,709,773

GLASS REINFORCED INJECTION MOLDING PELLET

Norman T. Hall, Phoenixville, Pa., assignor to Liquid Nitrogen Processing Corporation, Malvern, Pa.

Original application June 17, 1969, Ser. No. 833,983, now Patent No. 3,608,033. Divided and this application Oct. 27, 1970, Ser. No. 84,444
Int. Cl. B32b *5/02*
U.S. Cl. 161—176 1 Claim



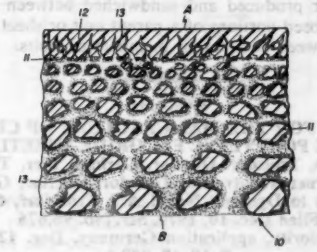
Process for production of molding compositions containing high weight percentage of glass comprising feeding an extruded mixture of glass fibers and molten thermoplastic resin to a cross-head die, coating continuous glass roving with said mixture in said cross-head die, solidifying said molten thermoplastic while said thermoplastic is coated on said roving, and pelletizing the same into pellets containing between about 61 to 90 weight percent glass. The molding composition is in the form of such pellets which generally comprise right cylinders having a diameter of between 3/32 and ¼ inch and a height of between ⅛ to ½ inch.

3,709,774

PREPARATION OF ASYMMETRIC POLYMER MEMBRANES

Shiro G. Kimura, Alplaus, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 13, 1970, Ser. No. 36,923
Int. Cl. B32b *5/18*
U.S. Cl. 161—159 3 Claims



A method is disclosed for the preparation (by the utilization of a proper solvent system) of dry asymmetric membranes comprising a porous layer of interconnected crystals of polymer material. Membranes of many polymer materials may be optionally prepared either with or without a dense surface layer as one face thereof. In either case the porous layer is structured with graded porosity. A three-component casting solution is prepared containing the polymer, a first good volatile solvent for the polymer and (relative to the first solvent) a poor less-volatile solvent for the polymer, which is miscible with the good solvent. A membrane is cast, allowed to desolvate for a short time and is then immersed in a leaching agent, that is miscible with both the aforementioned solvents but is a non-solvent for the polymer. The membrane is then permitted to dry.

3,709,775

PRODUCT COMPOSITIONS FOR MAGNETIC INDUCTION METHODS TO TREAT AND HEAT-SEAL PREDETERMINED AREAS OF PARENT UNITS

Albert L. James, Hickory Corners, Mich., assignor of a fractional part interest to William C. Heller, Milwaukee, Wis.

Continuation-in-part of abandoned application Ser. No. 786,294, Dec. 23, 1968, which is a division of application Ser. No. 374,470, June 11, 1964, now Patent No. 3,461,014, dated Aug. 12, 1969. This application Nov. 17, 1971, Ser. No. 199,445
Int. Cl. B29c *27/04;* C08f *45/04;* C08k *1/02*
U.S. Cl. 161—162 9 Claims

Certain product compositions for association in or attachment to one or more parent units to produce treatment and heat sealing of predetermined areas of the parent member or members. The product compositions in all instances include a stratum of a heat-reactive plastic material which has substantially uniformly dispersed therein very fine susceptor particles selected from the chemical family of magnetic oxides. These particles are electrically non-conductive and are preferably employed in an average size range between sub-micron and 20 microns in longest dimensions, the said stratum, subjected

to a suitable magnetic induction field, becoming rapidly heated to temperatures for heat processing the plastic material contiguous to the particles. In some instances the said stratum consists in a heat-fusible plastic surface or plastic unit with the susceptor particles dispersed rather densely and uniformly in said surface or unit. In other instances the stratum, with the susceptor particles embedded therein or carried thereby, is independently manufactured or produced and sandwiched between interfacing an opposed portions of a parent unit or sheet or sandwiched between two parent members or units.

3,709,776

PROCESS FOR THE MANUFACTURE OF CEMENTABLE POLYVINYL FLUORIDE SHEETING

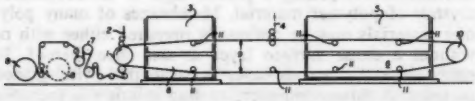
Otto Fuchs, Troisdorf-Oberlar, Gerhard Bier, Troisdorf, and Werner Trautvetter, Troisdorf-Oberlar, Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Filed Dec. 10, 1970, Ser. No. 96,876

Claims priority, application Germany, Dec. 12, 1969, P 19 62 329.1

Int. Cl. B32b *27/30, 27/40*

U.S. Cl. 161—189 **6 Claims**



Improvements in the joining of polyvinyl fluoride shaped articles, particularly film or sheeting, to other materials by means of an intermediate adhesive by using a solution or dispersion of a vinyl fluoride polymer which has been postchlorinated to a chlorine content of 5 to 27 weight percent or a copolymer of vinyl fluoride and vinyl chloride having a vinyl chloride content of 10 to 65 weight percent as the cement.

3,709,777

PHTHALATE POLYMER IMPREGNATED SHEET

Toshio Takikawa, Toyonaka, Kouji Satomo, Amagasaki, and Takashi Kodama, Nishinomiya, Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

No Drawing. Original application Nov. 6, 1968, Ser. No. 773,970, now Patent No. 3,671,354, dated June 20, 1972. Divided and this application June 15, 1971, Ser. No. 153,432

Int. Cl. B32b *27/10, 27/36*

U.S. Cl. 161—232 **1 Claim**

Method of manufacturing remarkably improved decorative laminate boards by utilizing resin comprising diallyl phthalate prepolymer substantially free from diallyl phthalate monomer, and a polyester composed of specific components in specific amounts; and resin-impregnated sheets in use for the manufacturing of said laminate boards.

3,709,778

METHOD FOR BLEACHING GROUNDWOOD PULP WITH TERTIARY BUTYL HYDROPEROXIDE

Robert Lincoln, Moylan, Pa., and Joseph A. Meyers, III, Springfield, Pa., assignors to Atlantic Richfield Company, New York, N.Y.

Continuation-in-part of Ser. No. 753,713, Aug. 19, 1968, abandoned. This application Jan. 12, 1971, Ser. No. 105,961

Int. Cl. D21c *9/16*

U.S. Cl. 162—71 **6 Claims**

Bleaching of ligneous cellulosic materials such as groundwood pulp by treating the pulp with an aqueous solution of tertiary butyl hydroperoxide and a buffering agent and thereafter contacting the pulp with a sulfite compound.

3,709,779

BLEACHING OF MECHANICAL PULPS WITH HYDROSULFITE IN THE PRESENCE OF AN ALKALI METAL SILICATE

Virendra N. Gupta, Hawkesbury, Ontario, Canada, assignor to Canadian International Paper Company, Montreal, Quebec, Canada

No Drawing. Filed Nov. 17, 1971, Ser. No. 199,750

Int. Cl. D21c *9/10*

U.S. Cl. 162—71 **11 Claims**

A process is described in which mechanical pulps are bleached with sodium or zinc hydrosulfite in the presence of sodium silicate. The addition of silicate increases the brightness gain obtained by hydrosulfite alone and reduces the grinding power consumption. Silicate can thus replace sodium tripolyphosphate for this use and thereby eliminate phosphate pollution due to newsprint or other paper mill effluents.

3,709,780

PROCESS AND PRODUCT FOR MAKING PAPER PRODUCTS OF IMPROVED DRY STRENGTH

Robert Clayton Slagel, Pittsburgh, and Gloria Di Marco Sinkovitz, Bridgeville, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 160,097, July 6, 1971. This application Nov. 4, 1971, Ser. No. 195,815

Int. Cl. D21d *3/00;* **D21h** *3/40*

U.S. Cl. 162—168 **5 Claims**

Paper products exhibiting markedly improved dry strength properties are produced by adding to the cellulose paper dispersion a chitin-based compound comprising a graft copolymer of 2-acrylamido-2-methylpropane sulfonic acid onto a chitosan substrate.

ERRATUM

For Class 162—167 see:
Patent No. 3,709,857

3,709,781

SPACE NUCLEAR PLANT

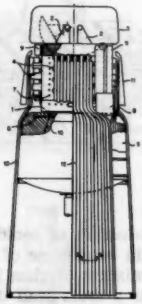
Peter Fiebelmann, Besozzo; Helmut Neu, Travedona, and Umberto Buzzi, Laveno, all of Italy, assignors to European Atomic Energy Community (Euratom), Brussels, Belgium

Filed May 12, 1969, Ser. No. 823,794

Claims priority, application Germany, May 24, 1968, P 12 64 364.0

Int. Cl. G21c *15/00*

U.S. Cl. 176—39 **6 Claims**



A nuclear power plant for space stations having a heating core, a reflector at least partially pivotal about the core and a system of heat pipes penetrating into the core. The heat pipes supply reaction heat to thermionic converters disposed in the reflector zone with heat reflected from the converters being dissipated into space by cooling means.

3,709,782

HETEROPLOID CELL LINES

Sydney Edwin Smith, Kevin J. O'Reilly, and John Prydie, London, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

No Drawing. Filed Oct. 3, 1969, Ser. No. 863,715
Claims priority, application Great Britain, Oct. 8, 1968, 47,737/68
Int. Cl. C12k *1/06, 7/00, 9/00*
U.S. Cl. 195—1.8 4 Claims

A heteroploid cell line produced by culturing and subculturing a diploid cell line in a medium providing the necessary nutritional composition such that the total passaging of the cell line exceeds the 40th to 50th passage level and until the proportion of cells having abnormal chromosomal characteristics rises above 25% of the total. The diploid cell line is derived from tissues of feline embryos which have been cultured and subcultured up to the 40th passage level. The heteroploid cell line is separated from the culturing medium and inoculated with a virulent strain of a virus so as to propagate the virus thereon. The propagated virus strain is then further passaged on heteroploid cell lines to produce an attenuated antigenic material that may be used in a vaccine. The propagated virus strain may also be inactivated with a suitable inactivating agent so as to produce an inactivated antigenic material that may be used in a vaccine.

3,709,783

PROCESS FOR PRODUCING PROTEINS BY FERMENTATION

Katsunobu Tanaka, Takeo Suzuki, Ken Yamaguchi, and Masaki Yamamoto, Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 677,862, Oct. 25, 1967. This application July 2, 1970, Ser. No. 52,067
Claims priority, application Japan, Oct. 28, 1966, 41/70,720
Int. Cl. C12b *1/00;* A23j *1/00*
U.S. Cl. 195—28 R 13 Claims

A process for producing proteins by fermentation which comprises culturing a microorganism capable of assimilating hydrocarbons and which belongs to the genus Arthrobacter, Brevibacterium, Micrococcus, Corynebacterium, Bacterium, Pseudomonas, Mycobacterium, Nocardia, Candida or Aspergillus under aerobic conditions in an aqueous nutrient medium containing at least one hydrocarbon as the main carbon source. The proteins accumulate extracellularly in the resultant culture liquor. An agent to help discharge the proteins into the medium may also be included therein, for example, antibiotics, surface active agents, higher fatty acids or higher fatty acid esters.

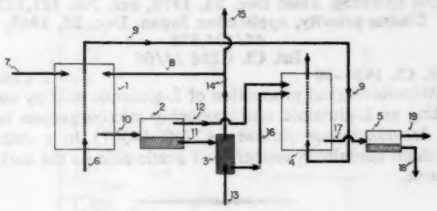
3,709,784

HYDROCARBON FERMENTATION

Andre Deschamps, Chatou, Sigismond Franckowiak, Montesson, Claude Gatellier, Boulogne, Seine, Georges Glikmans, Meudon la Foret, and Philippe Renault, Noisy le Roi, France, assignors to Institut Francais du Petrole, Des Carburants et Lubrifiants, Rueil Malmaison, France

Filed June 26, 1970, Ser. No. 50,184
Claims priority, application France, June 7, 1969, 6923037
Int. Cl. C12b *1/00*
U.S. Cl. 195—28 R 13 Claims

This invention relates to a five-steps process for growing microorganisms such as yeasts, said process comprising (a) growing a microorganism on a n-paraffins substrate, (b) separating a microorganism phase, (c) contacting the microorganism phase with a n-paraffinic stock which is



used thereafter as substrate for the first step, (d) subjecting the resulting microorganism to the cultivation conditions of step one, without added hydrocarbon, and (e) separating the resulting microorganisms.

3,709,785

METHOD OF PRODUCING L-TYROSINE BY FERMENTATION

Shinichiro Otsuka, Kanagawa-ken; Takeshi Honda, Kanagawa-ken, and Akio Yamanoi, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Oct. 13, 1970, Ser. No. 80,506
Claims priority, application Japan, Oct. 29, 1969, 44/86602
Int. Cl. C12d *13/06*
U.S. Cl. 195—29 9 Claims

Spontaneously or artificially induced mutants of microorganisms of the genera Brevibacterium, Corynebacterium, Arthrobacter, Bacillus, and Candida which are capable of growing on otherwise conventional culture media containing enough m-fluorophenylalanine to suppress growth of the respective parent strains include many strains also capable of producing extracellular L-tyrosine in amounts sufficient to warrant recovery on a commercial scale. The most effective tyrosine producing mutants were derived from strains of Brevibacterium flavum and lactofermentum, Bacillus subtilis, and Candida lipolytica.

3,709,786

PROCESS FOR PRODUCING NICOTINAMIDE ADENINE DINUCLEOTIDE

Kiyoshi Nakayama, Sagamihara-shi, Japan, assignor to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Continuation of abandoned application Ser. No. 656,651, July 28, 1967. This application June 17, 1968, Ser. No. 737,306
Claims priority, application Japan, July 29, 1966, 41/49,396, 41/49,397
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 N 10 Claims

The present disclosure relates to a method for producing nicotinamide adenine dinucleotide which comprises culturing a microorganism capable of producing nicotinamide adenine dinucleotide in an aqueous nutrient medium under aerobic conditions in the presence of at least one material selected from the group consisting of adenine adenosine, adenosine monophosphate, adenosine diphosphate and adenosine triphosphate with or without a second material selected from the group consisting of nicotinic acid, nicotinamide, nicotine mononucleotide, nicotinamide mononucleotide, nicotinic acid riboside, nicotinamide riboside, and nicotinic acid adenine dinucleotide. Derivatives and various mixtures of these compounds may be employed.

3,709,787
PRODUCING L-GLUTAMIC ACID
Toshihiko Kanzaki and Isamu Nakatsui, Kakogawa, Yoshio Sugiyama and Masaaki Nishio, Takasago, and Michio Ishikawa, Kobe, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
No Drawing. Filed Dec. 23, 1970, Ser. No. 101,113
Claims priority, application Japan, Dec. 25, 1969, 44/104,578
Int. Cl. C12d *13/06*
U.S. Cl. 195—30 2 Claims

Microbiological production of L-glutamic acid by cultivating an L-glutamic acid-producing microorganism such as *Brevibacterium flavum* (ATCC 14067) in a culture medium containing copper, and acetic acid as the carbon source.

3,709,788
BLEACHED STARCH COMPOSITION OF IMPROVED ENZYME CONVERTIBILITY AND PROCESS FOR USE THEREOF
Roland W. Best, Raymond A. Doughty, and Leonard F. Vander Burgh, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.
No Drawing. Filed Mar. 19, 1970, Ser. No. 21,519
Int. Cl. C12b *1/00*
U.S. Cl. 195—31 R 22 Claims

An improved enzyme convertible starch composition comprising bleached starch, calcium compound and sulfite salt or precursor. When mixed with water and alpha-amylase, and maintained between about 160° F. and 195° F. and between 6.0 and 7.5 pH, composition yields an improved starch conversion product.

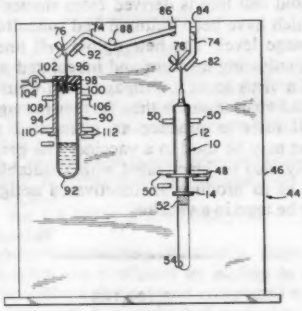
3,709,789
BIOCHEMICAL ALDOSTERONE SYNTHESIS
Eiji Kondo, Ikeda, Takashi Mitsugi, Senboku-gun, and Kazuo Tori, Kobe, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan
No Drawing. Application Jan. 13, 1969, Ser. No. 790,834, now Patent No. 3,631,031, which is a continuation-in-part of abandoned application Ser. No. 555,220, June 6, 1966. Divided and this application Feb. 16, 1971, Ser. No. 115,842
Claims priority, application Japan, June 11, 1965, 40/34,820, 40/34,821, 40/34,822
Int. Cl. C07c *167/00*
U.S. Cl. 195—51 R 10 Claims

Corticosterone or esters thereof is treated with the enzymes of Corynespora fungus to obtain novel 18-hydroxycorticosterone inter- and/or intra-molecular acetals and/or acylates thereof accompanied with several monohydroxycorticosterones, then the product is treated with acid or mixture of acid and acylating agent to form ether bridge between positions 11 and 18, finally the 18-deoxyaldosterone derivatives obtained are treated again with the enzymes of Corynespora fungus to prepare aldosterone, 18-dehydroaldosterone, 9α-hydroxy-11β,18-epoxy-4-androstene-3,17-dione.

3,709,790
PROTEOLYTIC ENZYME FORMULATION
Jack F. Beuk, 6 S. Madison St., Hinsdale, Ill. 60521, and William D. Warner, 732 Benton Court, Elmhurst, Ill. 60126
No Drawing. Filed Oct. 5, 1970, Ser. No. 78,133
Int. Cl. C07g *7/022*
U.S. Cl. 195—66 R 16 Claims

An improved method for preparing reversibly inactive plant derived proteolytic enzyme solutions for in vivo intravascular injection wherein: (1) the pH of the enzyme solutions are elevated to between about 8.0–10.0, and (2) the solutions are treated with suitable sequestering agents. These improvements permit the efficient processing of commercial size batches of more concentrated enzyme solutions without treatment with oxidizing agents.

3,709,791
METHOD AND APPARATUS FOR LYMPHOCYTE SEPARATION FROM BLOOD
Bernard Lichtenstein, Yorktown Heights, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.
Filed Apr. 13, 1971, Ser. No. 133,524
Int. Cl. C12k *1/00*
U.S. Cl. 195—127 6 Claims

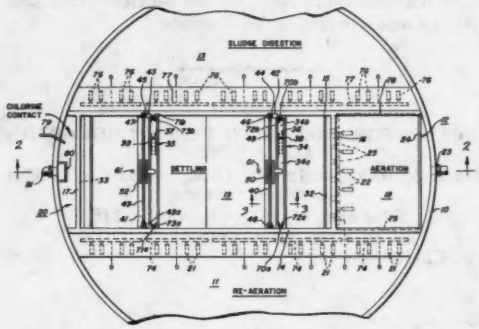


New and improved method and apparatus for the separation of lymphocytes from whole blood samples under sterile conditions are provided and comprise sterile, disposable syringe means in which are mixed and incubated a blood sample and a separating agent. The latter includes sensitized magnetic particles which are effective to tag the blood sample leukocytes to the substantial exclusion of the lymphocytes, and an erythrocyte sedimenting agent which is effective to promote the settling of the blood sample erythroytes. Following mixture incubation and settling in the syringe, the same is operatively positioned on sample transfer and magnetic separator means which include a sterile, disposable sample transfer tube and an operatively associated magnetic separator. The mixture is pumped at substantially constant flow rate from said syringe, by automatic actuation of the syringe plunger, for flow through said operatively associated transfer tube and magnetic separator with resultant substantial retention of the tagged leukocytes therein and continued flow of the lymphocytes in the plasma through the remainder of the transfer tube to lymphocyte collection means.

3,709,792
METHOD AND APPARATUS FOR TREATING SEWAGE
Quentin L. Hampton, Ormand Beach, Fla., assignor to FMC Corporation, San Jose, Calif.
Continuation-in-part of abandoned application Ser. No. 843,071, July 18, 1969. This application Feb. 16, 1971, Ser. No. 115,505
Int. Cl. C02c *1/06*
U.S. Cl. 210—7 8 Claims

An apparatus for treating sewage having a central zone compartmentalized to provide in line aeration, settling and disinfecting compartments with a common longitudinal axis for liquid flow therethrough and having a sludge

digestion compartment along one lateral side of said central zone and a sludge re-aeration compartment along the other lateral side of said central zone. Means are provided along the lateral side of the aeration compartment running parallel to the longitudinal flow axis, designed to deliver supernatant liquor with uniform distribution along the full length of the wall common to the digestion compartment and said aeration compartment and a re-aerated recycle sludge medium with uniform distribution along the full length of the wall common to said re-aeration compartment and said aeration compartment. Liquid flow



conducting means are positioned transverse to the longitudinal flow axis of the settling compartment and above the normal liquid level therin and control means are provided to direct part of the sludge to the re-aeration compartment and the balance of the sludge to the digestion compartment. Conduit means movable in said settling compartment transverse to the longitudinal flow axis is associated with said flow conducting means for delivery of sludge from the settling compartment and airlift means induces movement of settled sludge through said conduit means.

3,709,793

CONTROL OF ENVIRONMENTAL POLLUTION IN TALL OIL FRACTIONATION

Dellason F. Bress, Murray Hill, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.

Filed July 10, 1969, Ser. No. 840,723
Int. Cl. B01d *3/00*
U.S. Cl. 203—4 **7 Claims**

Tall oil is fractionated with little or no environmental pollution. The stripping steam and the odorous compounds it carries with it are condensed by foul water being recycled through the condenser, an amount of foul water equal to the stripping steam coming into the condenser being purged, revaporized and used again as stripping steam in the fractionation process.

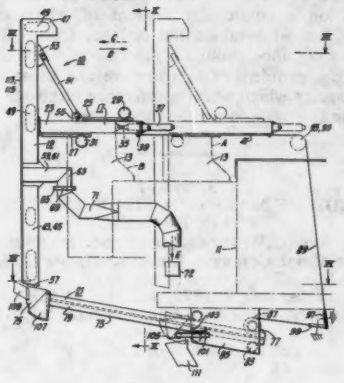
3,709,794

COKE OVEN MACHINERY DOOR EXTRACTOR SHROUD

Raymond C. Kinzler, Carnegie, William D. Edgar, Allison Park, and John D. Sustarsic, McKees Rocks, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed June 24, 1971, Ser. No. 156,412
Int. Cl. C10b *25/14*
U.S. Cl. 202—248 **10 Claims**

A shroud that is movable into position with a door extractor forms a seal with the buckstays of a coke oven and provides a curtain of negative pressure around the perimeter of the door. A spillage box is extended to a



position beneath the doorsill to catch the fallout of coke when the door is retracted.

3,709,795

PURIFICATION OF CARBOXYLIC ACIDS BY CHEMICAL TREATMENT AND DISTILLATION

Thomas C. Singleton, Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Feb. 2, 1970, Ser. No. 8,079
Int. Cl. B01d *3/34;* **C07c** *53/08*
U.S. Cl. 203—31 **10 Claims**

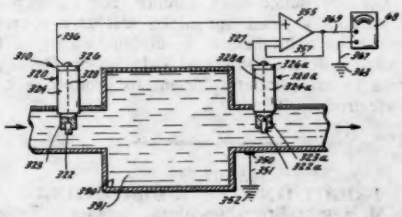
A process for the removal of halide impurities from carboxylic acids, said process comprising contacting a carboxylic acid containing halide impurities with a treating agent comprising an inorganic oxidizing agent, subjecting the treated carboxylic acid stream to distillation to remove an overhead and a bottoms product, said overhead product containing said carboxylic acid substantially purified of said halide impurities.

3,709,796

METHOD OF USING SELF-COMPENSATING ELECTRODE SYSTEM

Karl Lewis King, Milwaukee, and James R. Arrington, Muskego, Wis., assignors to American Limnetics Instruments Inc., Milwaukee, Wis.

Filed June 5, 1970, Ser. No. 43,864
Int. Cl. B01d *59/40*
U.S. Cl. 204—1 T **5 Claims**



An electrode type sensing device which employs two separated measuring electrodes of the same type and a common ground for making electrode potential determinations such as dissolved oxygen and pH measurement

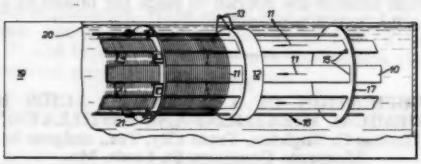
in a liquid. In one embodiment, one of the measuring electrodes is disposed in a standard solution which is placed in but sealed from the material to be tested except for an electrical communication. In an alternative embodiment, both measuring electrodes are placed in a material, the ion or molecular content of which is to be measured but, at a substantial distance from each other and with a common ground. Both embodiments eliminate the previous problem of temperature and other environmental aspects which affect a reference electrode and the measuring electrode in a different manner.

3,709,797

METHOD OF MAKING A FIBRE-REINFORCED PLAIN BEARING

James J. Stobo, Weybridge, England, assignor to The Glacier Metal Company Limited, Alperton, Wembley, England

Filed July 9, 1970, Ser. No. 53,453
Claims priority, application Great Britain, July 10, 1969, 34,852/69
Int. Cl. C23b 7/0; F16c 9/00
U.S. Cl. 204—16 **4 Claims**



The invention is a method of making bearing strips in which a steel or other backing has carbon or other fibres in successive pieces extending parallel with one another over one face, the fibres being embodied in a metal applied onto that face of the strip to form a reinforced bearing lining. In a method of making such a bearing a number of lengths of strip extending side by side are wound in an electroplating bath through which they progress.

3,709,798

ELECTRODEPOSITION OF NICKEL

Joseph R. Duchene, Southfield, Mich., assignor to The Richardson Chemical Company, Baltimore, Md.

No Drawing. Continuation-in-part of application Ser. No. 52,083, July 2, 1970. This application Oct. 13, 1971, Ser. No. 188,771
Int. Cl. C23b 5/08
U.S. Cl. 204—49 **3 Claims**

An aqueous acidic bath solution for electroplating nickel includes at least one nickel salt as a source of nickel and, as a brightener, a combination of an oxyethylenated sulfolene compound and a water-soluble allyl sulfonate in an amount sufficient to produce a bright nickel electrodeposit.

3,709,799

BRIGHT TIN ELECTRODEPOSITING

Marcis M. Kampe, Brookline, Mass., assignor to Enthone, Incorporated, New Haven, Conn.

No Drawing. Filed July 30, 1970, Ser. No. 59,730
Int. Cl. C23b 5/14
U.S. Cl. 204—54 R **24 Claims**

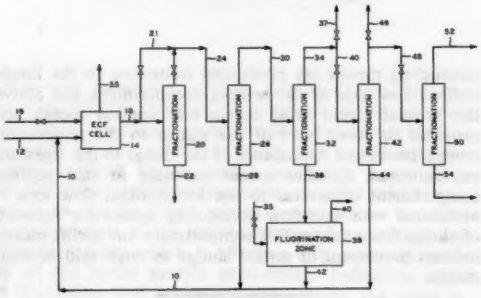
Acid tin baths for electrodepositing bright tin comprising tin ions, free acid, a non-ionic surface active agent and as a brightening agent a Schiff base-terminated, substantially linear, low molecular weight, soluble polymeric crotonaldehyde. The polymeric crotonaldehyde is a Schiff base-terminated homopolymer or copolymer. The mole ratio of the primary amine precursor of the Schiff base terminal group or groups to α-, β-ethylenically unsaturated aldehyde, which is crotonaldehyde in the case of the homopolymers and the total of crotonaldehyde plus a different α-, β-ethylenically unsaturated aldehyde copolymerizable compound when such a compound is a copolymerizable reactant, provided in the polymerization reaction mixture in the preparation of the polymer is in the molar ratio range of about 1:2.5 to about 1:7.5 respectively. Additive compositions for said tin electrodepositing baths are also provided by this invention.

3,709,800

PROCESS FOR PREPARING PERFLUOROCARBON COMPOUNDS

Homer M. Fox, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Mar. 19, 1971, Ser. No. 126,115
Int. Cl. C07b 29/06; C07c 19/08, 17/20
U.S. Cl. 204—59 R **12 Claims**



Perfluorocarbon compounds are produced by a process comprising a combination of steps including electrochemical fluorination and chemical fluorination.

3,709,801

PRODUCTION OF ALKYL SILICATES

Terence Gordon Tripp, Chester, England, assignor to Monsanto Chemicals Limited, London, England

Filed Feb. 10, 1970, Ser. No. 10,300
Claims priority, application Great Britain, Feb. 11, 1969, 7,342/69
Int. Cl. B01k 3/00
U.S. Cl. 204—59 **11 Claims**

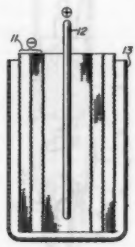
This invention involves the production of an alkyl silicate in which the alkyl group has from one to three carbon atoms involving the passage of an electric current through a liquid medium comprising a solution of a monohydric alcohol having from one to three carbon atoms per molecule and as a supporting electrolyte an acid or metal salt compatible with the monohydric alcohol with no more than 3 percent by weight of water based on the weight of the monohydric alcohol being present using a silicon anode and passing the electric current until alkyl silicates are present in the liquid medium.

3,709,802

LIQUID FOOD DECOLORIZATION

Akira Okuhara; Takashi Nakajima, both of Noda-shi, and Nobuo Saito, Nagareyama-shi, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda-shi, Japan

Filed March 9, 1970, Ser. No. 17,632
Int. Cl. B01k *1/00, 3/10*
U.S. Cl. 204—137 R 8 Claims



A liquid food such as soy sauce, and a fruit juice, is electrolytically reduced in an electrolytic cell comprising an anode isolated from the liquid food by an ion-permeable membrane, at least one metallic net or perforated plate cathode and a vessel for encasing the anode and the cathode by applying a potential between the electrode, while filling the liquid food in the vessel. Melanoidins contained in the liquid food is decolorized thereby.

3,709,803

METHOD OF TREATING METAL ARTICLES

Graham L. Gulick, 4559 N. Hamlin, Chicago, Ill. 60625

No Drawing. Continuation-in-part of application Ser. No. 833,720, June 16, 1969. This application Feb. 1, 1972, Ser. No. 222,656
Int. Cl. C23b *1/00, 3/06*
U.S. Cl. 204—140 11 Claims

A method of toughening high speed steels and carbon steel forming and cutting tools or the like comprising immersing a steel object in an aqueous treating bath which includes a cyanide salt, an alkali metal hydroxide, a sequestering agent for ferric ions at high pH, and, using the article as one electrode, passing an alternating current through said article and said bath at a potential of about 2.5 volts and a rate of about 1.75 amperes per square inch of surface of the article for a period of about one minute or less at a temperature slightly above ambient temperature. Metals so treated also display other described advantageous properties.

3,709,804

METHOD OF POLYMERIZATION OF VINYL CHLORIDE AND PRODUCING ITS COPOLYMERS

Vladimir Isaakovich Lukhovitsky, ulitsa Kurchatova 4, kv. 4; Andrei Mikhailovich Smirnov, ulitsa Kurchatova 2–a, kv. 56; Vladimir Vasilievich Polikarpov, ulitsa Kurchatovo 10, kv. 29; Alla Mikhailovna Lebedeva, ulitsa Krasnykh Zor 9, kv. 50; Raisa Mizovna Laguchevа, ulitsa Kurchatova 4, kv. 21; and Vladimir Lvovich Karpov, ulitsa Komosomolskaya 43, kv. 5, all of Obninsk, Kalubhaskaya oblast, U.S.S.R.

No Drawing. Filed Dec. 23, 1969, Ser. No. 887,741
Int. Cl. C08f *1/24*
U.S. Cl. 204—159.22 7 Claims

A method of polymerization and copolymerization of vinyl chloride, according to which emulsion polymerization of vinyl chloride or copolymerization thereof with water-soluble vinyl monomers is carried out under the effect of ionizing radiation in the presence of an ionogenic emulsifying agent taken with a concentration lower than the critical concentration of micelle formation of said emulsifying agent.

3,709,805

PRODUCTION OF POLYMERS WITH A FIBROUS STRUCTURE

Carl Heinrich Krauch, Heidelberg, and Axel Sanner, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed July 16, 1968, Ser. No. 745,113
Claims priority, application Germany, July 22, 1967, P 17 20 286.7; Feb. 24, 1968, P 17 20 350.8; May 30, 1968, P 17 70 528.1, P 17 70 529.2; May 31, 1968, P 17 70 543.0; June 1, 1968, P 17 70 552.1
Int. Cl. B01j *1/00;* C08d *1/00*
U.S. Cl. 204—159.22 11 Claims

Polymers having a fibrous structure are obtained by the polymerization of solutions and/or emulsions or dispersions, fully or partially solidified in crystalline form, of ethylenically unsaturated monomers with at least two polymerizable double bonds or mixtures containing at least 0.01% by weight of these monomers and monoethylenically unsaturated monomers by irradiation, which polymers can be obtained in the form of novel porous materials (=poromeric materials) having properties similar to leather.

3,709,806

PROCESS FOR THE PREPARATION OF RADIATION-CROSSLINKABLE FOAMABLE POLYOLEFIN PARTICLES

Satoyuki Minami, Yoshiaki Shinke, Ahozi Saito, and Atsushi Osakada, Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

No Drawing. Filed June 25, 1971, Ser. No. 157,008
Claims priority, application Japan, June 27, 1970, 45/56,355
Int. Cl. C08d *1/00;* C08f *1/00*
U.S. Cl. 204—159.2 14 Claims

A process is provided for manufacturing foamable polyolefin particles. In the process of this invention a polyolefin resin is blended with a hydrocarbon additive which has a boiling point which is higher than the melting point of the polyolefin resin and a chemical blowing agent which decomposes into gas upon being heated. The resulting mixture is shaped into substantial void free particles and irradiated with radial radiation or ultraviolet radiation to crosslink the mixture. The product of this process is especially used in manufacturing shaped articles using conventional chest molding techniques.

3,709,807

METHODS OF SEPARATING BY-PRODUCTS SULFURIC ACID FROM MIXTURES RESULTING FROM PHOTO-SULFOXIDATION REACTION OF PARAFFINS

Rinnosuke Susuki, Tokyo, and Sadao Toyoda and Kuniyoshi Takenouchi, Funabashi, Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

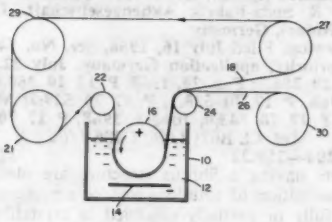
No Drawing. Filed Mar. 23, 1970, Ser. No. 22,001
Claims priority, application Japan, Mar. 28, 1969, 44/23,662; Mar. 29, 1969, 44/23,965
Int. Cl. B01j *1/10*
U.S. Cl. 204—162 R 14 Claims

Methods of separating the by-product sulfuric acid from the reaction mixture resulting from photo-sulfoxidation of paraffins in which the concentration of the sulfuric acid is from 30 to 95% by weight, which comprise the step of neutralizing said reaction mixture with caustic alkali or contact the reaction mixture with undiluted sulfuric acid, thereby settling the by-product sulfuric acid within the reaction mixture.

3,709,808
PROCESS FOR THE ELECTRODEPOSITION OF POLYMERS

Fred H. Hammond, Jr., Wellesley, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Apr. 27, 1970, Ser. No. 32,106
Int. Cl. B01k 5/02
U.S. Cl. 204—181 4 Claims

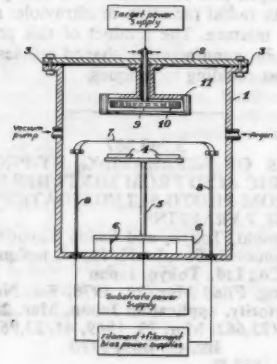


Self-sustaining polymeric films of low conductivity and low water content are continuously formed by an electrodeposition process in which the migrating particles are caused to coalesce on a water-bearing layer placed between a bath of suspended charged polymer particles and a rotating cylindrical electrode bearing a charge opposite to the charge on the particles.

3,709,809
SPUTTER DEPOSITION OF REFRACTORY CARBIDE ON METAL WORKING

Robert J. Wright, Arvada, John S. Chapin and George Mah, Boulder, and Claude A. Karstendiek, Arvada, Colo., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 15, 1971, Ser. No. 162,778
Int. Cl. C23c 15/00
U.S. Cl. 204—192 12 Claims



A method of coating metalworking tools with a thin uniform adherent layer of refractory carbide, e.g., titanium carbide, is disclosed. Such coating is applied by triode sputter deposition using a refractory carbide cathode and a tool substrate.

3,709,810
HYDROGEN ION SELECTIVE SENSOR AND ELECTRODE THEREFOR

Willard T. Grubb, and Lawrence H. King, both of Schenectady, N.Y., assignors to General Electric Company

Filed Sept. 30, 1970, Ser. No. 76,794
Int. Cl. G01n 27/46
U.S. Cl. 204—195 R 3 Claims

A hydrogen ion selective sensor has a sensing electrode with a palladium oxide coated palladium surface element and a reference electrode. A specific hydrogen ion selective sensor has a sensing electrode with a palladium oxide coated palladium surface element, a reference electrode spaced from and electrically insulated from the sensing electrode, an electrically insulating cover surrounding the palladium portion of the sensing electrode and the reference electrode, the cover defining an electrolyte chamber for containing a reference electrolyte therein, and a wick extending outwardly from the chamber adjacent the palladium oxide portion of the sensing electrode. An improved hydrogen ion selective sensing electrode is described which has a palladium oxide coated palladium surface element.

3,709,811
SPECIFIC ION ELECTRODE FOR SULFATE

Alex Michael Saunders, Bedford Village, N.Y., assignor to the United States of America as represented by the Secretary of the Department of Health, Education, and Welfare

No Drawing. Filed Sept. 21, 1970, Ser. No. 74,199
Int. Cl. G01n 27/30
U.S. Cl. 204—195 M 4 Claims

An active surface area sulfate ion selective composition suitable for electrodes is achieved by mixing barium sulfate particles in a room temperature (r.t.) silicone rubber matrix, and polymerizing at about 140°–150° F. using conventional catalysts or cross-linking agents to uniformly fix or set the barium sulfate in the hardened polymers in a time zone of not more than one minute.

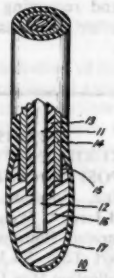
3,709,812
CARBON DIOXIDE SENSOR

Leonard W. Niedrach and John A. Bergeron, Schenectady, N.Y., assignors to General Electric Company

Filed Oct. 16, 1970, Ser. No. 81,197
Int. Cl. G01n 27/46
U.S. Cl. 204—195 P 3 Claims

A carbon dioxide sensor has an elongated flexible current collector, an electrochemically active region of hydrided palladium with a surface coating of platinum black in electrical contact with a portion of the current

collector, a second elongated flexible current collector surrounding the first current collector, a second electrochemically active region of silver and silver halide in electrical contact with the second current collector, a first layer of electrical insulation disposed between the first and second current collectors, a second layer of



electrical insulation disposed over the second current collector, an anion exchange resin electrolyte contacting both electrochemically active regions, and an outer sheath of carbon dioxide diffusion barrier material encapsulating at least the electrochemically active regions and the electrolyte.

3,709,813

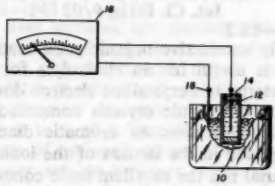
ION-SELECTIVE ELECTROCHEMICAL SENSOR

Rowland Edward Johnson, and Isaac Trachtenberg, both of Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 768,705, Oct. 18, 1968, abandoned. This application April 30, 1971, Ser. No. 139,193

Int. Cl. G01n *27/36*

U.S. Cl. 204—195 G 4 Claims



The ion concentration of a specific element in a solution may be determined by an ion-selective electrochemical sensor. Ion-selective electrochemical sensors are produced from a non-oxide glass containing a doping element either having a reaction with, or of the same material as the ion concentration to be measured. The action of the ion concentration in the solution with the doping element in the non-oxide glass produces a potential which is a measure of ion concentration. Two techniques are employed to produce the non-oxide glass containing selected ions. One technique produces the composition by combining in one operation the high purity elements required for making a specific glass with the selected elemental material, and the second technique adds a dopant to a pre-treated glass speciman. With both techniques, a quartz ampule containing the glass and dopant is evacuated, sealed and heated. The heated glass and dopant form a molten mass which is agitated to insure complete mixing and then cooled to slightly above the softening point. Solidification of the finished material is accomplished by a quenching step to produce the desired characteristics.

3,709,814

HYDROFINING-HYDROCRACKING PROCESS USING PALLADIUM-CONTAINING CATALYST

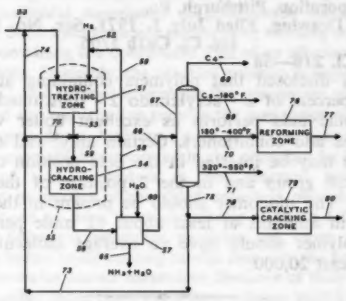
Joseph Jaffe, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of application Ser. No. 760,460, Sept. 18, 1968. This application Mar. 6, 1970, Ser. No. 17,127

The portion of the term of the patent subsequent to Oct. 20, 1987, has been disclaimed

Int. Cl. C10g *13/06, 23/02;* C01b *33/28*

U.S. Cl. 208—59 3 Claims



A hydrofining-hydrocracking process which comprises contacting a hydrocarbon feed containing more than 50 parts per million of organic nitrogen and containing substantial amounts of materials boiling above 200° F., said feed being selected from the group consisting of petroleum distillates, solvent-deasphalted petroleum residua, shale oils and coal tar distillates, in a reaction zone with hydrogen and a catalyst, at hydrofining-hydrocracking conditions including a temperature in the range 400° to 950° F., a pressure in the range 800 to 3500 p.s.i.g., a liquid hourly space velocity in the range 0.1 to 5.0, and a total hydrogen supply rate of 200 to 20,000 s.c.f. of hydrogen per barrel of feedstock, removing ammonia from the effluent from said reaction zone, and recovering hydrofined and hydrocracked products from said reaction zone, said catalyst comprising:

(A) A gel matrix comprising:
  (a) at least 15 weight percent silica,
  (b) alumina, in an amount providing an alumina-to-silica weight ratio of 15/85 to 80/20,
  (c) nickel or cobalt, or the combination thereof, in the form of metal, oxide, sulfide or any combination thereof, in an amount of 1 to 10 weight percent, based on said matrix, calculated as metal,
  (d) molybdenum or tungsten, or the combination thereof, in the form of metal, oxide, sulfide or any combination thereof, in an amount of 5 to 25 weight percent, based on said matrix, calculated as metal;

(B) A crystalline zeolitic molecular sieve:
  (a) containing from 0.1 to 2.0 weight percent palladium, calculated as metal,
  (b) containing less than 5 weight percent sodium,
  (c) being in particulate form and being dispersed throughout said matrix by cogelation of said matrix around said sieve;

said catalyst composite being further characterized by an average pore diameter below 100 angstroms and a surface area above 200 square meters per gram.

ERRATUM

For Class 208—112 see:
Patent No. 3,709,817

ERRATUM

For Class 210—7 see:
Patent No. 3,709,792

3,709,815
BOILER WATER TREATMENT

Jerry Emile Boothe, Pittsburgh, and Thomas Edward Cornelius III, Coraopolis, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

No Drawing. Filed July 1, 1971, Ser. No. 158,987
Int. Cl. C02b *5/06*
U.S. Cl. 210—58 **7 Claims**

It is disclosed that polymers containing at least 12 mole percent of 2 - acrylamido 2 - substituted propane-1-sulfonic acid perform as excellent boiler water dispersives and conditioners. Certain alkyl and other substitutes may be inserted in the beta position of the unsaturated group and in the 2 position of the propane group. The monomer should be present in the polymer chain in amounts at least about 12 mole percent, and the polymer should have an average molecular weight of at least 20,000.

3,709,816
CONTROL OF ALLUVIAL AND OTHER DEPOSITS IN AQUEOUS SYSTEMS

Jerry Lee Walker, Coraopolis, and Jerry Emile Boothe, Pittsburgh, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

No Drawing. Filed July 1, 1971, Ser. No. 158,986
Int. Cl. C02b *5/06*
U.S. Cl. 210—58 **6 Claims**

Polymers of 2-acrylamido methyl propyl sulfonates or sulfonic acid are used to fluidize and disperse insoluble alluvial deposits, such as silt, from water systems.

3,709,817
SELECTIVE HYDROCRACKING AND ISOMERIZATION OF PARAFFIN HYDROCARBONS

Robert M. Suggitt and John H. Estes, Wappingers Falls, and Stanley Kravitz, Wiccopee, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed May 18, 1971, Ser. No. 144,622
Int. Cl. C10g *35/08*
U.S. Cl. 208—112 **18 Claims**

Paraffin hydrocarbons are selectively hydrocracked and isomerized under controlled conversion conditions by contacting the hydrocarbon with hydrogen, a fluorided Group VII–B or VIII metal-alumina catalyst and water or water precursors as a conversion reaction moderator. By employing a fluorided metal-alumina catalyst and water or water precursor moderator, paraffin hydrocarbons are selectively hydrocracked and isomerized in a manner such that the selectivity, activity and product distribution is controlled over the course of the conversion reaction.

3,709,818
CONDENSATE POLISHING

Hilding B. Gustafson and Howard W. Frazer, Tucson, Ariz., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

No Drawing. Filed Oct. 1, 1969, Ser. No. 862,919
Int. Cl. B01d *15/06*
U.S. Cl. 210—32 **15 Claims**

This invention relates to the regeneration of anion exchange resins used in mixed ion exchange resin bed demineralizers wherein the resins are separated, the anion exchange resin fraction regenerated with an alkali metal compound, and the regenerated resins admixed to reform the mixed bed. Specifically, the invention comprises treatment of the anion exchange resin fraction after regeneration to replace the alkali metal cation associated with the cation exchange resin present in the anion exchange resin fraction with an alkaline earth metal cation selected from the group consisting of calicum, barium, strontium, and mixtures thereof, and removing the alkali metal cation from the fraction prior to admixture of the resins to reform the mixed bed.

3,709,819
OIL PHASE DRILLING FLUID ADDITIVE, COMPOSITION AND PROCESS

William C. Browning, Houston, Tex.; Billy G. Chesser, Houston, Tex., and Jerry L. Wood, Cypress, Tex., assignors to Milchem Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 857,384, Sept. 12, 1969, abandoned. This application May 14, 1971, Ser. No. 143,631
Int. Cl. C10m *1/28, 1/14*
U.S. Cl. 252—8.5 P **6 Claims**

This invention relates to an oil phase drilling fluid composition, additive, and process which is effective at high temperatures and pressures and which consists essentially of (1) a vinyl toluene-acrylate copolymer resin which is obtained by reacting (a) vinyl toluene, with (b) an acrylate moiety, selected from the class containing of methyl, ethyl, 2-ethylhexyl, butyl and dodecyl acrylates and methacrylates, (2) a water-in -oil emulsion and (3) asphalt particles.

3,709,820
SOLID ELECTROLYTE

Susumu Yoshimura, Shirow Asakawa, and Katsue Hasegawa, Osaka, Japan, assignors to Matsushita Electric Industrial Company, Limited, Kadoma City, Osaka, Japan

No Drawing. Filed Feb. 25, 1971, Ser. No. 119,058
Claims priority, application Japan, Mar. 4, 1970, 45/18,894; Mar. 5, 1970, 45/19,141
Int. Cl. H01g *9/02*
U.S. Cl. 252—62.2 **3 Claims**

An ionically conductive organic solid material is provided, which is useful for an electrolyte for electric devices. The material is a crystalline electron donor-acceptor complex comprising ionic crystals composed of 7,7,8,8-tetracyanoquinodimethane, an aromatic diamine, and a liquid impregnated in the lattices of the ionic crystals so that the material has the excellent ionic conductivity suitable for an electrolyte.

3,709,821
ORGANIC SOLID ELECTROLYTE

Susumu Yoshimura, No. 1006, Oaza Kodama, Kadoma, Osaka, Japan

Filed Feb. 25, 1971, Ser. No. 119,059
Claims priority, application Japan, March 4, 1970, 45/18896
Int. Cl. H01g *9/02*
U.S. Cl. 252—62.2 **3 Claims**

An ionically conductive organic solid material which is useful for an electrolyte for electric devices. The material is a crystalline electron donor-acceptor complex comprising 7,7,8,8-tetracyanoquinodimethane and a monovalent cation and a small amount of high molecular weight interstitial inclusion impurities selected from the group consisting of cyanine and triphenylmethane dyes so that the material has an excellent ionic conductivity suitable for an electrolyte.

3,709,822

METHOD OF MANUFACTURING MAGNET CORES AND MAGNET CORES MANUFACTURED BY THE SAME

Johannes Maria Jozef Ritzen, and Hans Peter Peloschek, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 24, 1971, Ser. No. 156,573
Claims priority, application Netherlands, June 26, 1970, 7009421
Int. Cl. C04b *35/26*
U.S. Cl. 252—62.6 6 Claims

The invention relates to a method of manufacturing magnet cores consisting of representatives of a special class of lithium-, copper-, zinc-, (cobalt-) ferrites, by sintering at temperatures which do not exceed 1100°C. These cores may serve to replace, nickel-containing and hence more expensive, ferrite cores which may serve as "yoke" rings or as aerial rods.

3,709,823

METHOD OF MANUFACTURING HIGHLY VISCOUS, ACIDIC BASE MATERIALS FOR DETERGENTS

Yujiro Sugahara, Tokyo, and Masanori Tanaka, Shibata, Japan, assignors to Mizusawa Industrial Chemicals, Ltd., Osaka, Japan

No Drawing. Filed June 16, 1970, Ser. No. 46,837
Int. Cl. B01j *13/00*; C11d *3/08*
U.S. Cl. 252—136 4 Claims

Method of manufacturing highly viscous, acidic base materials for detergents by converting silica hydrogel or silica alumina hydrogel into a hydrosol with water by the technique of wet grinding, and contacting the thus obtained hydrosol with mineral acid, thereby regulating the mineral acid content of said hydrosol to from 3 to 20% by weight.

3,709,824

METHOD AND COMPOSITION FOR CHEMICAL POLISHING OF STAINLESS STEEL SURFACES

Nakaaki Oda, Nagaharu Morioka, and Yoshio Makino, Takaoka, and Akira Yoshida, Tonami, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

No Drawing. Filed Jan. 7, 1971, Ser. No. 104,731
Int. Cl. C11d *7/08*; C23g *1/02*
U.S. Cl. 252—142 11 Claims

Stainless steel surfaces are treated with an aqueous solution containing phosphate ions equivalent to 145–580 g./litre of phosphoric acid, nitrate ions equivalent to 17–85 g./litre of nitric acid, chlorine ions equivalent to 16–80 g./litre of hydrochloric acid, sulfosalicylate ions equivalent to 1–10 g./litre of sulfosalicylic acid and small amounts of optional compounds selected from the group of water soluble polymer, aromatic amino compounds, surfactant, ligninsulfonic acid and salts thereof, sulfuric acid and acids having equivalent concentration of 4.0 N–18 N.

3,709,825

CLEANING COMPOSITION

William Chirash, New Providence, and Barney Joseph Zmoda, Bridgewater Township, Sommerset County, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 680,944, Nov. 6, 1967, abandoned.
This application Oct. 16, 1970, Ser. No. 81,564
Int. Cl. C11d *7/22*
U.S. Cl. 252—158 2 Claims

A substantially single phase aqueous liquid composition comprising a detergent selected from the group consisting of anionic and nonionic detergents, a glycol ether, a nitrilo compound selected from the group consisting of nitrilotriacetic acid and alkali metal and ammonium nitrilotriacetates, and a salt selected from the group consisting of alkali metal and ammonium metal and ammonium borates, said composition in water having a pH of at least 8.5.

3,709,826

HALOAPATITE PHOSPHORS IN THE FORM OF SPHERICAL PARTICLES AND METHOD OF MAKING SAME

Larry L. Pitt, Florissant, and James W. Starbuck, Grantwood Village, Mo., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.

Filed June 1, 1970, Ser. No. 41,818
Int. Cl. C09k *1/36*
U.S. Cl. 252—301.4 P 4 Claims

Alkaline earth haloapatite phosphors are provided in the novel form of substantially spherical particles, having diameters between about 1 and 20 microns. Haloapatite phosphor particles having this configuration are prepared by spray drying a semicolloidal suspension of precipitated haloapatite crystallites. Such a suspension is prepared by reacting aqueous solutions containing the constituent ions of an alkaline earth halophosphate. Desirably, the reaction solution is digested at about 60° C. and filtered to remove the precipitate which is then washed and reslurried to provide the suspension which is fed to the spray dryer. Activators such as antimony and manganese are normally incorporated in the phosphor by including ions of such activators in the reactant solutions. Fluorescent properties of the dried spherical phosphor are fully developed by brief thermal refining at about 1,050° to 1,200° C. Spherical phosphor particles are more readily dispersible in the usual coating media than are the irregular phosphor particles known heretofore. Because of their ability to pack together more closely and have a lesser void fraction, spherical phosphors provide fluorescent lamp coating of improved uniformity and greater optical density.

3,709,827

FLUORESCENT MATERIALS FOR OPTICAL FREQUENCY CONVERSION

Francois E. Auzel, 39 Avenue Port Royal des Champs, le Mesnil Saint-Denis, France

Filed Feb. 8, 1971, Ser. No. 113,317
Claims priority, application France, Feb. 10, 1970, 7004606
Int. Cl. C09k *1/06*; C03c *3/28*
U.S. Cl. 252—301.4 R 6 Claims

Fluorescent material for the optical frequency conversion of near infrared radiation form 0.85 to 1.06 μm into visible radiation. The constituents of the material are (i) vitrifying fluorides of lead, beryllium and magnesium, (ii) devitrifying and activating fluoride of ytterbium and (iii) doping fluoride of erbium for a green and red response and doping fluoride of thulium for a blue response. The content of ytterbium fluoride controls the form of the material, either glassy ceramic or polycrystalline. Proper preparation conditions and proportions allow to prepare either a glass material or a ceramic material.

3,709,828

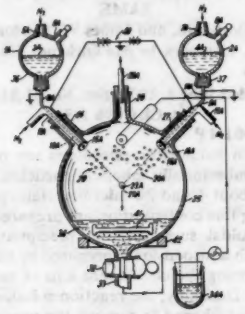
METHOD FOR FORMING SUBMICRON DIPOLE PARTICLES

Alvin M. Marks, 166—35 9th Ave., Whitestone, N.Y. 11357

Continuation-in-part of application Ser. No. 378,836, June 29, 1964. This application Feb. 13, 1970, Ser. No. 11,176
Int. Cl. F21v *9/00*
U.S. Cl. 252—300 10 Claims

Submicron dipole particles are produced by providing at least two reactant fluids which, when mixed together in substantially stoichiometric relationship, form a dipole precipitate by controlling such variables as formation time and limiting the volume of the reacting liquid to a predetermined volume. A preferred method resides in impinging a jet stream of at least one of said reactant fluids against a jet stream of at least one other of said reactant

fluids to effect a mixing of said fluids in a resultant stream over a predetermined distance at a predetermined flow



rate conducive for providing by reaction dipoles having a desired average dimension.

3,709,829

CATALYST COMPOSITION

Edward James Gasson, Dollar, Scotland, assignor to BP Chemicals Limited, London, England

No Drawing. Filed Oct. 6, 1970, Ser. No. 78,574
Claims priority, application Great Britain, Oct. 13, 1969, 50,076/69
Int. Cl. B01j *11/06*
U.S. Cl. 252—461 3 Claims

The present invention relates to catalyst compositions containing antimony together with one or more polyvalent metals, the antimony being introduced in two stages, initially as a tetroxide and then as a trioxide, the two types being present in specific proportions, the total mixture being subjected finally to a heat treatment in the presence of molecular oxygen.

3,709,830

p-QUINONEDIIMONIUM SALTS AND THEIR USE AS INFRARED ABSORBERS

Peter Vincent Susi, Middlesex, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 377,044, June 22, 1964, which is a division of application Ser. No. 333,729, Dec. 26, 1963, which in turn is a continuation-in-part of application Ser. No. 281,059, May 16, 1963, all now abandoned. This application Dec. 21, 1967, Ser. No. 692,310
Int. Cl. F21v *9/00*; G02b *5/20*; G02c *7/10*
U.S. Cl. 252—300 7 Claims

A defined class of N,N,N',N'-tetraarylquinonediimonium salts useful as infrared absorbers is disclosed; especially the N,N,N',N' - tetrakis(p - dialkylaminophenyl)-p-benzoquinonediimonium salts, such as N,N,N',N'-tetrakis-(p-diethylaminophenyl) - p - benzoquinonebis(imonium-hexafluoroantimonate). The diimonium salts are obtained by oxidation of N,N,N',N'-tetraarylarylenediamines with silver salts or by electrolytic methods.

3,709,831

PREPARATION OF ACID-AMIDE MIXTURES USEFUL AS SOLVENTS

Guy A. Crossley, Sycamore Township, Hamilton County, and David C. Heckert, Oxford, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed June 16, 1971, Ser. No. 153,846
Int. Cl. B01f *1/00*
U.S. Cl. 252—364 8 Claims

Process for preparing mixtures of carboxylic acids and amides in the presence of water comprising reacting an amine hydrohalide with a carboxylic acid using certain catalysts, especially phosphoric acid. The resulting acid-amide mixtures are useful as solvents for the preparation of vicinal glycols; alternatively, the acid-amide mixtures can be refined to provide pure amides useful in preparing glycols.

3,709,832

METHOD FOR THE PREPARATION OF A CATALYST USABLE FOR CATALYTIC CRACKING OF HYDROCARBONS

Takeo Ao, Osaka, Japan, assignor to Osaka Yogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Continuation-in-part of application Ser. No. 869,863, Oct. 27, 1969. This application Sept. 24, 1970, Ser. No. 75,289
Int. Cl. C10g *11/04*
U.S. Cl. 252—429 R 4 Claims

This invention relates to a method for the preparation of a catalyst usable for catalytic cracking of hydrocarbons, characterized by the steps of

(I) pulverizing a carrier member selected from the group consisting of α-alumina containing above 98% of Al_2O_3, a magnesium clinker containing above 96% of MgO and below 1% of an iron oxide, SiC, ZrO_2, ZnO, ThO_2, MoO_2 and Fe_2O_3 into particles passing through a Tyler Standard 65-mesh sieve,

(II) mixing the particles with a nickel oxide in an amount of 1 to 30% by weight and a binder which comprises

(A) 0.1 to 2.8% by weight of starch treated with acid until the outer skin is destroyed and then heating at 100° to 300° C.;

(B) 0.05 to 2.5% by weight of a member selected from the group consisting of alkali metal carbonates and phosphates, calcium, magnesium and ammonium carbonates, chlorides, fluorides, sulfates and phosphates, zinc and iron phosphates and mixtures thereof, and

(C) 0.05 to 2.5% by weight of a member selected from the group consisting of chlorides and phosphates of the material of Step I with the proviso that (1) the total weight components A, B and C do not exceed 0.2 to 3% of the particles of Step I, (2) that components B and C be different and (3) the ratio of $A/A+B+C$ is between 0.38 and 0.98, $B/A+B+C$ is between 0.017 and 0.945 and $C/A+B+C$ is between 0.17 and 0.945;

(III) molding the mixture to a shaped product, drying the shaped product and

(IV) then calcining the dried product at a temperature of about 1250° C. to about 1350° C. to produce the catalyst.

Alternatively, the binder may be calcined without the nickel oxide, subsequently impregnated with nickel oxide and calcined again.

3,709,833

PROCESS FOR PREPARING HIGH PURITY SILICON OXIDE POROUS BEADS DOPED WITH SMALL QUANTITIES OF OTHER OXIDES

Ian M. Thomas, Temperance, Mich., assignor to Owens-Illinois, Inc.

Filed Aug. 21, 1970, Ser. No. 66,060
Int. Cl. B01j *11/44*
U.S. Cl. 252—448 29 Claims

There is disclosed the preparation of high purity, high surface area, porous beads of silicon oxide doped with small quantities of other oxides, which preparation comprises hydrolyzing a silicon alkoxide dissolved in a hydroxyl containing organic solvent with less than a stoichiometric amount of water so as to provide a partially hydrolyzed intermediate product. The resulting partially hydrolyzed intermediate

product is then treated with additional water and an immiscible non-polar organic medium so as to form a discontinuous phase of liquid partially hydrolyzed intermediate product dispersed in a continuous phase of organic medium. As a source of dopant oxide, a selected water soluble salt is added to the process at any convenient step prior to the next process step of pH adjustment, e.g. before, during, or after the partially hydrolyzing; before, during, or after the organic medium treatment. The dispersed intermediate product is then treated with a base and a quantity of water sufficient to hydrolyze any residual alkoxy groups in the dispersed intermediate product. The resulting mixture is stirred until the dispersed intermediate is converted to firm, hard, solid, porous beads of silicon oxide doped with at least one other oxide. The beads are typically recovered by filtration and evaporation of non-solid residues or by like method.

3,709,834

METHOD OF MAKING A URANIUM CONTAINING CATALYST FOR A METAL ELECTRODE

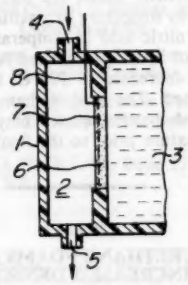
Masataro Fukuda, Toyonaka-shi; Takashi Miura, Chigasaki-shi, and Katsuhiro Takahashi, Hirakata-shi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 21, 1969, Ser. No. 851,943

Claims priority, application Japan, Aug. 26, 1968, 43/61551; May 23, 1969, 44/41253

Int. Cl. B01j *11/08*

U.S. Cl. 252—470 **10 Claims**



An electrochemical electrode adapted for use in fuel cell batteries, metal-air batteries and electrochemical oxygen evolution instruments, and comprising an active catalyst which contains uranium and which in a small amount exhibits a catalytic activity equal to that obtainable from a larger amount of the conventional catalyst.

3,709,835

NOVEL COMPOSITIONS WITH CONTROLLED ELECTRICAL PROPERTIES

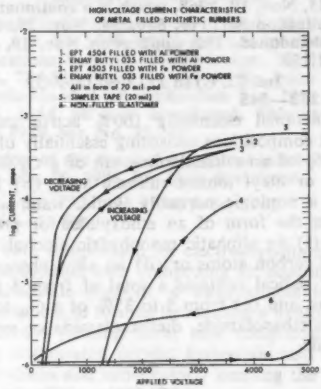
Eric O. Forster, Scotch Plains, N.J., assignor to Esso Research and Engineering Company

Continuation of application Ser. No. 678,655, Oct. 27, 1967. This application Sept. 29, 1970, Ser. No. 76,648

Int. Cl. H01b *1/02, 7/00*

U.S. Cl. 252—513 **6 Claims**

Semi-conductive materials suitable for use as high voltage insulators comprising a polymer having a dielectric constant of at least 2.0 and a filler selected from the group consisting of electrically conductive metals and their alloys, said filler having a particle size range of about


HIGH VOLTAGE CURRENT CHARACTERISTICS OF METAL FILLED SYNTHETIC RUBBERS
1- EPT 4504 FILLED WITH Al POWDER
2- ENJAY BUTYL 035 FILLED WITH Al POWDER
3- EPT 4503 FILLED WITH Fe POWDER
4- ENJAY BUTYL 035 FILLED WITH Fe POWDER
All in form of 70 mil pad
5- SIMPLEX TAPE (20 mil)
6- NON-FILLED ELASTOMER
DECREASING VOLTAGE
INCREASING VOLTAGE
log CURRENT, amps
APPLIED VOLTAGE

0.05 to about 50 microns, said particles having a linear distribution of particle size with an average particle size of about 1 to about 20 microns.

3,709,836

BUILT ANIONIC DETERGENT COMPOSITION HAVING INVERSE FOAM-TO-TEMPERATURE RELATIONSHIP AND PROCESS FOR PRODUCING SAME

Jack Thomas Inamorato, Westfield, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 41,359, May 28, 1970. This application May 28, 1970, Ser. No. 41,602

Int. Cl. C11d *3/30, 7/32*

U.S. Cl. 252—525 **16 Claims**

A detergent composition having an inverse foam to temperature relationship is disclosed, as well as a binary composition for accomplishing this relationship when added to a detergent system. The inverse foam to temperature relationship is provided by a synergistic mixture of a fatty acid having a saturated or unsaturated alkyl chain of from about 14 to 22 carbon atoms and a high molecular weight primary, secondary or tertiary amine containing between about eight and 30 carbon atoms in the alkyl chain.

3,709,837

SPRAY DRIED DETERGENTS CONTAINING SODIUM-POTASSIUM DOUBLE SILICATE

Helmut H. Weldes, Havertown, Pa., assignor to Philadelphia Quartz Company, Philadelphia, Pa.

Filed Dec. 30, 1970, Ser. No. 103,002

Int. Cl. C11d *3/08, 7/14, 11/02*

U.S. Cl. 252—527 **6 Claims**

A method has been found for increasing the silicate content in spray dried detergents without decreasing the spray dryer throughput. The method involves the preparation of detergent slurries with high solids content by adding alkali metal silicates to the slurries in the form of sodium-potassium double silicate glass. Thus, the amount of water that must be removed in the drying tower is reduced and/or the silicate content can be increased when compared with slurries prepared with sodium silicate solutions.

3,709,838

LIQUID DETERGENT COMPOSITIONS

Marvin L. Mausner, Teaneck, and Arnold H. Dater, Fair Lawn, N.J., assignors to Witco Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 777,143, Nov. 19, 1968, which is a continuation-in-part of application Ser. No. 510,358, Nov. 29, 1965, both now abandoned. This application Nov. 19, 1970, Ser. No. 91,153

Int. Cl. C11d *1/18, 3/32, 7/32*

U.S. Cl. 252—545 19 Claims

Polyfunctional essentially 100% active stable liquid detergent compositions consisting essentially of (a) from 30 to 90% of an ethanolamine salt of a C_8 to C_{18} alkyl benzene- or alkyl toluene-sulfonic acid, (b) from 5 to 35% of a nonionic normally liquid, water-soluble surfactant in the form of an ethoxylated or propoxylated ether of (i) an aliphatic monohydric alcohol containing at least 8 carbon atoms or (ii) an alkyl phenol in which the alkyl radical contains a total of from 5 to 18 carbon atoms, and (c) from 5 to 35% of a C_{10} to C_{16} fatty acid monoethanolamide, diethanolamide or monoisopropanolamide.

3,709,839

FIBER-FORMING COMPOSITIONS HAVING IMPROVED DYE RECEPTIVITY, PROCESS FOR THEIR PREPARATION AND NEW BASIC NITROGEN COMPOUNDS EMPLOYED THEREIN

Vittorio Cappuccio, Cornelio Caldo, and Giuseppe Cantatore, Terni, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Application May 24, 1967, Ser. No. 640,808, now Patent No. 3,527,846, dated Sept. 8, 1970, which is a continuation-in-part of application Ser. No. 124,346, July 17, 1961. Divided and this application Mar. 31, 1970, Ser. No. 24,346

Claims priority, application Italy, July 20, 1960, 12,800/60; Mar. 3, 1961, 3,985/61; May 24, 1961, 13,357/61

Int. Cl. C08f *29/12;* C08g *23/12*

U.S. Cl. 260—2 BP 4 Claims

Fiber-forming compositions having improved dye receptivity comprise a polymer selected from the group consisting of polyalphamonoolefins and polyacrylonitrile and from about 1 to 25% by weight, based on the weight of the polymer, of a basic nitrogen-containing compound, said compound having been obtained by either (A) reacting epichlorohydrin with:

(A_1) two disecondary C_6–C_{60} aliphatic, aromatic or heterocyclic diamines selected from the group consisting of polyalphamonoolefins and diamines containing primary amine groups which act as secondary amine groups due to steric hindrance, or

(A_2) one disecondary diamine according to (A_1) and one C_3–C_{30} primary aliphatic amine, or

(B) reacting epichlorohydrin with a disecondary aliphatic, aromatic or heterocyclic C_4–C_{60} diamine or a diamine containing primary amine groups which act as secondary amine groups due to steric hindrance.

Basic nitrogen-containing compounds obtained by either of the foregoing reactions (A) and (B).

3,709,840

CURING AGENT FOR EPOXY RESIN COMPRISING A CYCLIC ANHYDRIDE TREATED WITH AN AMINO ALCOHOL

Ronald L. Dehoff, Maplewood, N.J., assignor to R. T. Vanderbilt Company, Inc., New York, N.Y.

No Drawing. Filed Oct. 8, 1970, Ser. No. 79,367

Int. Cl. C08g *30/14*

U.S. Cl. 260—2 EC 10 Claims

The specification relates to treating an anhydride with an amino alcohol. The treated anhydride is used as a curing agent for epoxy resins.

3,709,841

SULFONATED POLYARYLETHERSULFONES

Jean-Pierre Quentin, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Apr. 28, 1970, Ser. No. 32,535

Claims priority, application France, Apr. 30, 1969, 6913810

Int. Cl. C08g *23/00, 23/20*

U.S. Cl. 260—2.2 R 8 Claims

Novel sulphonated polyarylether-sulphones are useful as cation-exchange resins especially for ion-exchange membranes useful in osmosis and reverse osmosis.

3,709,842

POROUS HYDROGELS AND METHOD OF MANUFACTURING SAME

Artur Stoy, Prague, Czechoslovakia, assignor to Ceskoslovenska Akademie ved, Prague, Czechoslovakia

No Drawing. Filed Sept. 2, 1971, Ser. No. 177,494

Claims priority, application Czechoslovakia, Sept. 10, 1970, 6,207/70

Int. Cl. C08c *17/08;* C08d *13/08;* C08f *47/10*

U.S. Cl. 260—2.5 R 8 Claims

This invention is for porous hydrogels of partly hydrolyzed polyacrylonitrile which are useful as sorbents and which are made by dissolving or swelling polyacrylonitrile in concentrated nitric acid at temperatures under 50° C. until the degree of hydrolysis desired is attained. The temperature is then increased to 50° C. to 85° C. until the polymer is foamed. The acid is then removed from the polymer by washing. Porophors may be added to the polymer acid mixture prior to the final heating phase.

3,709,843

POLYURETHANE FOAMS HAVING INCREASED DENSITY

Natale C. Zocco, East Haven, and Stanley I. Cohen, Orange, Conn., assignors to Olin Corporation, New Haven, Conn.

No Drawing. Continuation-in-part of applications Ser. No. 708,524, Feb. 27, 1968, now abandoned, Ser. No. 780,247, Nov. 29, 1968, now Patent No. 3,506,600, Ser. No. 573,189, Aug. 18, 1966, and Ser. No. 661,756, Aug. 4, 1967, both now abandoned. This application Apr. 9, 1970, Ser. No. 27,149

The portion of the term of the patent subsequent to Apr. 14, 1987, has been disclaimed

Int. Cl. C08g *53/08*

U.S. Cl. 260—2.5 AN 11 Claims

Flexible, densified polyurethane foams are prepared by allowing a polyurethane foam-forming reaction mixture to rise, thereby forming a partially cured cellular material, maintaining the partially cured cellular material for a critical period of time at a critical environmental temperature, and applying a compressive force to the partially cured cellular material to reduce its volume by a desired amount. After removal of the compressive force, completion of the cure, and trimming, if necesary, the resulting flexible, densified polyurethane foams are useful as cushioning and rug padding.

3,709,844

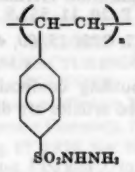
POLY(p-STYRENESULFONYLHYDRAZIDES) AS BLOWING AGENTS FOR PLASTICIZED POLY-(VINYL CHLORIDE)

John E. Herweh and Algirdas C. Poshkus, Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

No Drawing. Original application July 30, 1968, Ser. No. 748,658, now Patent No. 3,654,242. Divided and this application Nov. 20, 1970, Ser. No. 91,531

Int. Cl. C08f *47/10, 29/24*
U.S. Cl. 260—2.5 P 1 Claim

A novel class of polymeric compositions having repeating structural units of the formula



These compositions find utility as polymeric blowing agents for use in forming foamed resinous compositions.

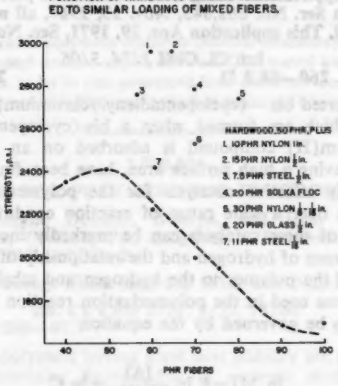
3,709,845

MIXED DISCONTINUOUS FIBER REINFORCED COMPOSITES

Kamel Boustany and Aubert Yaucher Coran, Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 29,033, Apr. 16, 1970. This application July 6, 1971, Ser. No. 159,955

Int. Cl. B32b *5/08;* B60c *1/00*
U.S. Cl. 260—17.4 BB 11 Claims


LONGITUDINAL TENSILE STRENGTH IN P.S.I. OF HARDWOOD CELLULOSE COMPOSITE AS FUNCTION OF HARDWOOD LOADING COMPARED TO SIMILAR LOADING OF MIXED FIBERS.
STRENGTH, p.s.i.
PHR FIBERS
HARDWOOD, 50 PHR, PLUS
1. 10 PHR NYLON
2. 15 PHR NYLON 1/8 in.
3. 7.5 PHR STEEL 1/8 in.
4. 20 PHR SOLKA FLOC
5. 30 PHR NYLON 1/8 - 1/4 in.
6. 20 PHR GLASS 1/8 in.
7. 11 PHR STEEL 1/8 in.

Composites of organic polymer matrix having dispersed therein a mixture of discontinuous fibers of different widths or lengths are described.

3,709,846

TRIMELLITIC ANHYDRIDE MODIFIED POLYCARBOXYLIC ACID ELECTROCOATING RESINS

Ivan H. Tsou, Pontiac, Mich., assignor to Ford Motor Company, Dearborn, Mich.

No Drawing. Continuation-in-part of application Ser. No. 733,187, Apr. 24, 1968, which is a continuation-in-part of applications Ser. No. 363,814, Apr. 30, 1964, and Ser. No. 734,825, Apr. 24, 1968, the latter being a continuation-in-part of application Ser. No. 363,815, Apr. 30, 1964, all now abandoned. This application Sept. 25, 1970, Ser. No. 75,748

The portion of the term of the patent subsequent to Apr. 20, 1988, has been disclaimed

Int. Cl. C09d *3/58, 3/64, 5/02*
U.S. Cl. 260—18 EP 10 Claims

A paint bath composition for electrodeposition of paint upon an anode, said bath comprising an aqueous dispersion of particulate pigment, a water-soluble base, and a polycarboxylic acid formed by reacting a hydroxyl bearing of hydroxyl yielding linear base compound with an olefinically unsaturated acrylic, carboxylic acid of about 18 carbon atoms and subsequently reacting the resultant resin with trimellitic anhydride.

3,709,847

PREPARATIONS OF REACTION PRODUCTS OF EPOXIDES, FATTY AMINES AND BASIC POLYAMIDES, PROCESSES FOR THEIR MANUFACTURE AND THEIR USE

Rosemarie Toepfl, Basel, Heinz Abel, Reinach, and Arthur Maeder, Therwil, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Jan. 29, 1971, Ser. No. 111,088

Claims priority, application Switzerland, Feb. 6, 1970, 1,174/70

Int. Cl. C08g *41/04*
U.S. Cl. 260—18 PN 17 Claims

A process for the manufacture of stable preparations of water-soluble or water-dispersible reaction products of epoxides, fatty amines and basic polyamides is provided. The epoxides contain at least two epoxide groups per molecule, the amines are higher-molecular weight fatty amines [$H_3C—(CH_2)_x—NH_2$ wherein x represents an integer having the value of 11 to 23] and the polyamides are made from polymeric unsaturated fatty acids and polyalkylenepolyamines. The reaction is carried out in the presence of an organic solvent at temperatures up to 95° C. Not later than after completion of the reaction, it is ensured that a sample of the reaction mixture has a pH-value of 2 to 8 after dilution with water. The resulting reaction products are soluble in water and are useful in the textile industry e.g. for rendering wool non-felting.

3,709,848

HIGH TEMPERATURE CURE SYSTEMS FOR ETHYLENE PROPYLENE DIENE MONOMERS

Jeffrey M. Gerstin, Edison, and John T. Kehn, Roselle, N.J., assignors to Esso Research and Engineering Company

Continuation of abandoned application Ser. No. 689,829, Dec. 12, 1967. This application Jan. 29, 1971, Ser. No. 111,093

Int. Cl. C08f *29/12, 29/22;* C08g *37/20*
U.S. Cl. 260—19 UA 10 Claims

Ethylene propylene diene monomers are cured using phenolic resins and a halogen containing polymeric cure activator.

3,709,849

COLD-SET PROCESS FOR THE PRODUCTION OF PHENOLIC NOVOLAK RESINOUS FOUNDRY CORES

Peter Herbert Richard Bryan Lemon, Sherfield, and Christopher Terron, Southampton, England, assignors to Borden, Inc., New York, N.Y.

No Drawing. Filed Dec. 3, 1969, Ser. No. 881,873

Int. Cl. C08g 51/24; C09d 5/02

U.S. Cl. 260—29.3 15 Claims

This invention relates to foundry cores having high strengths prepared by a cold-set process employing a first granular material coated with a liquid composition comprising a methylolated product in conjunction with a second granular refractory material coated with a mixture comprising an acidic material and a suspension or solution of phenolic novolak resin.

3,709,850

PURIFICATION OF POLYOLEFINS

Roy C. Harrison and Donald L. Crain, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Feb. 16, 1971, Ser. No. 115,792

Int. Cl. C08f 1/88, 3/08

U.S. Cl. 260—93.7 16 Claims

A treating process for removing catalyst residue from polyolefins by combining a polyolefin with an aqueous solution of a fluorinated organic material and agitating said materials together at a temperature in the range of 200–275° F. for a time period in the range of from about 5 to 60 minutes. In another embodiment the polyolefin can be dissolved in a solvent and thereafter agitated at a temperature in the range of 65–275° F.

3,709,851

PREPARATION OF CIS-1,4-POLYISOPRENE

Kan Mori, Fumitake Imaizumi, Hisaya Sato, Isao Nagaoka, Shigetoshi Hirayanagi, Toru Shibata, and Shigeo Kawatani, Kanagawa-ken, Japan, assignors to Japan Synthetic Rubber Co., Ltd. (Nihon Gosei Gomu Kabushiki Kaisha), Tokyo, Japan

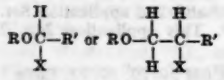
No Drawing. Filed Nov. 12, 1970, Ser. No. 89,144

Claims priority, application Japan, Nov. 21, 1969, 44/93,512

Int. Cl. C08d 1/28, 3/10

U.S. Cl. 260—94.3 12 Claims

High molecular weight cis-1,4-polyisoprene is produced by contacting isoprene with a catalyst comprising (A) a titanium tetrahalide, (B) an organo-aluminum compound represented by the general formula $AlR^1R^2R^3$ (wherein R^1 and R^2 which may be same or different, represent alkyl, aryl or cycloalkyl radical, and R^3 represents alkyl, aryl, cycloalkyl radical or hydrogen) and (C) a monohaloether represented by the general formula



(wherein R represents alkyl, alkenyl, cycloalkyl or aryl radical, R' represents alkyl radical or hydrogen and X represents halogen).

The activity of this catalyst is not adversely affected by such impurities as cyclopentadiene that are contained in the isoprene feed stock.

3,709,852

ANTISTATIC THERMOPLASTIC MOULDING COMPOSITIONS

Wolfgang Gordon, Hofheim, Taunus, Hans-Jerg Kleiner, Bad Soden, Taunus, and Ulrich van Spankeren, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Mar. 9, 1971, Ser. No. 122,555

Claims priority, application Germany, Mar. 11, 1970, P 20 11 551.9

Int. Cl. C08f 15/00, 45/00

U.S. Cl. 260—88.2 S 6 Claims

Thermoplastic moulding compositions for the making of antistatic shaped articles are disclosed. Compounds of the formula

wherein R_1 is an alkyl radical of 8 to 24 carbon atoms and R_2 and R_3 are alkyl radicals of 1 to 3 carbon atoms, have proved to be especially efficient antistatic agents, particularly in view of their advantageous toxicological properties and of the fact that other favourable properties of the plastic materials, in which they are contained, are not adversely affected.

3,709,853

POLYMERIZATION OF ETHYLENE USING SUPPORTED BIS - (CYCLOPENTADIENYL)CHROMIUM [II] CATALYSTS

George L. Karapinka, Piscataway, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of applications Ser. No. 708,638, Feb. 27, 1968, and Ser. No. 769,696, Oct. 22, 1968, said applications being a continuation-in-part of application Ser. No. 682,045, Nov. 13, 1967, all now abandoned. This application Apr. 29, 1971, Ser. No. 138,611

Int. Cl. C08f 1/74, 3/06

U.S. Cl. 260—88.2 D 23 Claims

Supported bis - (cyclopentadienyl)chromium[II] catalysts, which are formed when a bis-(cyclopentadienyl) chromium[II] compound is adsorbed on an inorganic oxide having a high surface area, have been found to be unusually effective catalysts for the polymerization of ethylene over a wide range of reaction conditions. The activity of these catalysts can be markedly increased in the presence of hydrogen and the relationship of the melt index of the polymer to the hydrogen and ethylene concentrations used in the polymerization reaction has been found to be governed by the equation

$$\ln MI = k \ln \frac{[A]}{[A+B]} + \ln C \qquad (1)$$

where MI represents the melt index of the polyethylene, A represents the hydrogen concentration in mole percent, B represents the ethylene concentration in mole percent, and k and C represent empirically-determined constants.

3,709,854

PETROLEUM RESINS

Paul Hepworth; Ian Stanley Ripley, and Norman Scott, all of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 1, 1971, Ser. No. 177,113

Claims priority, application Great Britain, Sept. 7, 1970, 42,768/70

Int. Cl. C08f *15/04, 15/42*

U.S. Cl. 260—82 7 Claims

In a process in which a C_5 fraction from a cracked naphtha or gas oil is polymerized with the help of a Friedel Crafts catalyst to produce a petroleum resin, the resin properties are improved and polymerization time reduced by heating the C_5 fraction to a temperature of at least 160°C for a period of up to 5 hours before the polymerization.

3,709,855

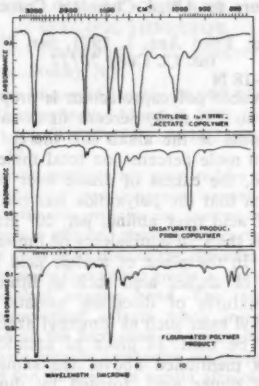
METHOD OF MANUFACTURING A FLUORINATED POLYMER

Ronald E. Gilbert, Shawnee Mission, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 17, 1970, Ser. No. 64,512

Int. Cl. C08f *27/03*

U.S. Cl. 260—87.3 2 Claims



Unsaturated polymers made by thermal deacetoxylation of ethylene-vinyl acetate copolymers are fluorinated under mild conditions, as by in situ-generated lead tetrafluoride, to yield readily processable thermoplastic fluorhydrocarbon polymers.

3,709,856

PROCESS FOR POLYMERIZING FLUOROOLEFINS

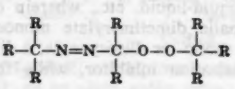
Julius Eugene Dohany, Berwyn, and John Casimer Grigger, Oreland, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Filed May 21, 1970, Ser. No. 39,558

Int. Cl. C08f *3/22, 3/32, 15/06*

U.S. Cl. 260—87.7 9 Claims

Fluoropolymers having good heat stability are prepared by polymerizing fluoroolefins in aqueous medium, in emulsion or suspension, using as the polymerization catalyst an initiator having the formula



where the R substituents are lower alkyl groups which may be the same or different.

3,709,857

NEUTRAL CURE WET STRENGTH RESINS PREPARED BY POLYMERIZING GLYOXALOLATED ACRYLAMIDE WITH FURTHER ACRYLAMIDE AND A BASIC, NITROGEN-CONTAINING MONOMER

Robert W. Faessinger, Media, Pa., assignor to Scott Paper Company, Delaware County, Pa.

No Drawing. Filed Feb. 25, 1971, Ser. No. 118,952

Int. Cl. C08g *9/02;* D21h *3/52*

U.S. Cl. 162—167 5 Claims

High molecular weight, pH independent, thermosetting, cationic, wet strength resins are prepared by a two-stage process which comprises, first, reacting glyoxal with acrylamide and then polymerizing the glyoxalolated acrylamide with acrylamide in the presence of a basic nitrogen-containing monomer. These resins are useful in the preparation of paper products having improved, off-machine dry strength and wet strength properties.

3,709,858

POLYESTERAMIDE COATING COMPOSITIONS

Kenneth H. Albers, Alden E. Blood, and Thomas C. Snapp, Jr., all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 41,577, May 28, 1970, Pat. No. 3,652,501. This application June 10, 1971, Ser. No. 151,952

Int. Cl. C08g *41/00, 20/30*

U.S. Cl. 260—29.2 N 28 Claims

A process for the production of water-soluble alkyd resins and to protective coating compositions made therefrom. The resins are prepared by reacting polycarboxylic aliphatic or aromatic acids, anhydrides or mixtures thereof having four to 20 carbon atoms with a polyhydric aliphatic or cycloaliphatic alcohol of two to 10 carbon atoms to give a reaction product having an acid number of 50–250. The product is then reacted with N,N-bis[2-hydroxyalkyl]-2-hydroxy-ethoxyacetamide to give the alkyd resins.

3,709,859

METHOD FOR THE PRODUCTION OF POLYESTERS WITH A NOVEL MULTICOMPONENT CATALYST

Josef Hrach and Theodor Wimmer, both of Schaftenau Nr. 76, Tyrol, Austria

Continuation-in-part of application Ser. No. 732,044, May 27, 1968. This application Aug. 18, 1971, Ser. No. 172,754

Claims priority, application Austria, June 2, 1967, A 15,144/67; Sept. 29, 1967, A 8,872/67

Int. Cl. C08g *17/013, 17/015*

U.S. Cl. 260—75 R 7 Claims

Polyesters, such as polyethylene terephthalate are prepared by heating a dicarboxylic acid ester, such as dimethyl terephthalate, with an aliphatic or cyclic diol, such as ethylene glycol, to a temperature in the order of 100° C.–360° C. in the presence of a catalyst containing (a) antimony, (b) lead and (c) calcium, strontium or barium. The catalyst is preferably a mixture of finely divided metals or alloys. The products are characterized by a light color and excellent color and heat stability.

3,709,860

MATERIALS BASED ON POLYMERS HAVING RECURRING ACETYLENICALLY UNSATURATED GROUPS AND CURABLE BY IRRADIATION

Erhard Fischer and Gerhard Wegner, Mainz, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Aug. 5, 1970, Ser. No. 61,495
Claims priority, application Germany, Aug. 9, 1969, P 19 40 692.9
Int. Cl. C08g 22/16
U.S. Cl. 260—77.5 AP 3 Claims

Solvent-soluble polymers which contain recurring molecular units having two conjugated carbon-carbon triple bonds and which can be converted by irradiation into insoluble colored systems. The polymers of the invention are suitable for the production of optical information patterns.

3,709,861

PROCESS FOR LIGHT-INDUCED CURING OF EPOXY RESINS IN PRESENCE OF CYCLOPENTADIENYLMANGANESE TRICARBONYL COMPOUNDS

William S. Anderson, Oakland, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 14, 1970, Ser. No. 98,180
Int. Cl. C08g 30/12
U.S. Cl. 260—47 EC 3 Claims

The cure of polyepoxide resins with a reactive acid anhydride or polymercaptan curing agent is accelerated in the presence of light and a catalytic amount of a cyclopentadienyl-manganese tricarbonyl compound, e.g., methylcyclopentadienyl-manganese tricarbonyl.

3,709,862

PROCESS FOR THE PREPARATION OF POLYIMIDES

Muneyoshi Minami, Otsu-shi, Japan, assignor to Toray Industries, Inc., Tokyo, Japan

Filed Sept. 12, 1969, Ser. No. 857,492
Claims priority, application Japan, Sept. 13, 1968, 43/65,531
Int. Cl. C08g 20/32
U.S. Cl. 260—47 CP 3 Claims

A novel class of polyimide polymers are provided which are obtained by reacting a functional derivative of a tricarboxylic or a tetracarboxylic acid such as an anhydride or acyl halide with 1,3-phenylene bis-(p-aminophenyl) ether or a mixture of amines containing 1,3-phenylene bis-(p-aminophenyl) ether. The novel polyimide polymers of this invention have excellent heat resistance and in addition have improved flexibility and elongation in comparison with known polyimide polymers. The polymers of this invention are especially useful for forming shaped articles, such as insulation tape or as enamel coatings for electric wire.

3,709,863

METHOD FOR EXTRUDING POLYACETYLENES TO PRODUCE HIGH STRENGTH GRAPHITE PRECURSORS

Dwain M. White, Schenectady, and Stanley Y. Hobbs, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 24, 1971, Ser. No. 118,472
Int. Cl. C08f 45/28; C01b 31/04
U.S. Cl. 260—30.2 7 Claims

A method is provided for extruding polyacetylene to produce extrudate which is convertible to high strength graphite fiber by extruding the polyacetylene in the form of a blend of the polyacetylene, and a mixture of a volatile plasticizer such as ortho-dichlorobenzene and a substantially non-volatile plasticizer, such as 1,4-diphenylbutadiyne.

3,709,864

POLYURETHANES

Frederic Christian Loew, Ridgewood, Edward Stone, Morris Plains, and Frank Peter Civardi, Wayne, N.J., assignors to Inmont Corporation, New York, N.Y.

Continuation-in-part of applications Ser. No. 819,337, Apr. 25, 1969, and Ser. No. 1,277, Jan. 7, 1970. This application Apr. 3, 1970, Ser. No. 25,580
Int. Cl. C08g 51/44
U.S. Cl. 260—32.6 N 19 Claims

Microporous leather substitutes are made from high molecular weight linear thermoplastic elastomeric polyurethanes of I.V. 0.9–2 which have been prepared by reaction in solution in dimethylformamide ("DMF") solvent which contains substantially no free tertiary amine. A monofunctional strong mineral acid is added to neutralize free tertiary amine groups. A hydroxyl-terminated prepolymer and a diol chain extender are reacted with a small excess of diisocyanate, until the —NCO content becomes constant, then a diol chain extender in amount equivalent to the remaining —NCO and reaction is continued, and then terminated with an alcohol after the high I.V. is attained.

3,709,865

METHOD OF PREPARING CATIONIC DYEABLE POLYCAPROLACTAM

Robert Alden Lofquist, Richmond, Lamberto Crescentini, Chester, and Robert Charles Winckhofer, Richmond, Va., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Apr. 1, 1971, Ser. No. 130,441
Int. Cl. C08g 20/12
U.S. Cl. 260—18 N 16 Claims

Cationic dyeable polycaprolactam is prepared by adding from 0.5 to 2.0 mole percent of N-sulfobutylhexamethylenediamine or the alkali salt thereof with preferably 0.5 to 2.6 mole percent (on total moles of lactam) of azelaic acid, the excess of diacid over diamine being preferably such that the polyamide has zero to 80 more equivalents of acid over amine, per 10^6 grams of polymer. Also, less than 30 equivalents of amino end groups are preferred. In the place of azelaic acid may be used an alkali salt of azelaic acid such as lithium hydrogen azelate, or mixtures of disodium azelate with azelaic acid. The dialkyl ester such as dimethyl azelate of azelaic acid can also be used. In place of azelaic acid, or its equivalents as mentioned above, the same number of equivalents of dimer acid, formed by dimerization of oleic acid, can be used. Alkali cation may also be added by adding alkali oxide, hydroxide, carbon or bicarbonate.

3,709,866

PHOTOPOLYMERIZABLE DENTAL PRODUCTS

Duncan E. Waller, Milford, Del., assignor to Dentsply International Inc., York, Pa.

No Drawing. Continuation-in-part of application Ser. No. 836,650, June 25, 1969. This application June 1, 1970, Ser. No. 42,466
The portion of the term of the patent subsequent to Dec. 21, 1988, has been disclaimed
Int. Cl. C09j 3/26
U.S. Cl. 260—27 R 19 Claims

Photopolymerizable dental products are provided in the form of compositions suitable as composite restorative materials, fissure sealants, cements, cavity liners and restoration glazes, the compositions being capable of being photopolymerized in situ, within the oral environment, by the application of light energy, specifically light energy in the near ultraviolet wave length band. Such a composition is made in two parts, i.e., paste-paste, paste-liquid, jelly-powder, liquid-liquid, etc., wherein one phase contains an aromatic dimethacrylate monomer or adduct thereof with a mono- or diisocyanate, a diluent monomer and a polymerization inhibitor, while the other phase

contains a material sensitive to ultraviolet light and capable of initiating free radical polymerization when excited thereby. Optionally, the paste phases may contain fillers which are characterized by having a refractive index no greater than 0.075 different from that of the polymer resulting from the free radical polymerization.

3,709,867

PROCESS FOR LUBRICATING VINYL POLYMERS WITH SITOSTEROL COMPOUNDS AND STABILIZED PRODUCT THEREOF

Joseph V. Karabinos, Milford, Conn., Karl M. Leopold, Toledo, Ohio, and William P. Doherty, Blacksburg, Va., assignors to Owens-Illinois, Inc.

No Drawing. Filed Nov. 22, 1971, Ser. No. 201,199
Int. Cl. C08f *45/34, 45/38*
U.S. Cl. 260—28.5 A 8 Claims

Beta sitosterol, its isomers and aliphatic esters with from 2 to 18 carbon atoms and epoxidized forms thereof have been found to be excellent lubricants for processing vinyl polymers such as polyvinyl chloride. In addition, these sitosterol derivatives improve the stability of vinyl polymers when used with conventional stabilizers such as dibutyl tin laurate.

3,709,868

OPIUM ALKALOID ANTIGENS AND ANTIBODIES SPECIFIC THEREFOR

Sidney Spector, Livingston, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 36,999, May 13, 1970, abandoned. This application March 8, 1971, Ser. No. 122,204
Int. Cl. C07g *7/00;* A61k *23/00*
U.S. Cl. 260—121 5 Claims

Opium alkaloid antigens are prepared by coupling opium alkaloid haptens to immunogenic carrier materials. In preferred embodiments proteins are used as carrier materials and the coupling is effected through the carboxyl group of a carboxy lower alkyl derivative of the phenolic hydroxy group of said alkaloid and a free amino group on the protein thereby yielding a covalent peptide bond. The resulting antigens produce immunological effects when injected into host animals, including the formation of opium alkaloid specific antibodies. These specific antibodies are useful in bioanolytical techniques for the assay of opium alkaloids in biological fluids.

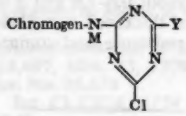
3,709,869

REACTIVE TRIAZINE AZO DYESTUFFS

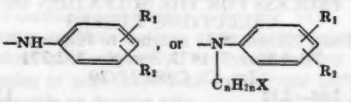
Jorge Aurelio Mazza, Av. Libertador Gral., San Martin 2687, Buenos Aires, Argentina

No Drawing. Filed Sept. 30, 1969, Ser. No. 862,439
Claims priority, application Argentina, Oct. 1, 1968, 216,848
Int. Cl. C09b *62/00, 62/02, 62/08*
U.S. Cl. 260—153 4 Claims

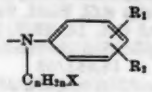
Reactive fiber dyes having the structural formula:



wherein the chromogen is an azo or anthraquinone dye; Y is Cl,



M is H or $-C_nH_{2n}X$; R_1 and R_2 are the same or different and represent H, or an alkyl, sulfo, nitro, halo, carboxy, alkoxy, or like group; X is sulfo, carboxy, hydroxy, or a low molecular weight, strongly polar organic group; and *n* is one or two, M being H only when Y is



processes for preparing such dyes; and processes for dyeing vegetable fibers, regenerated cellulose, animal fibers, and synthetic polyamide fibers with purity and brightness of shade and good fastness to wet treatments.

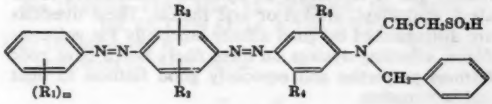
3,709,870

DISAZO DYESTUFFS

Gerhard Wolfrum, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed June 4, 1970, Ser. No. 43,581
Claims priority, application Germany, June 13, 1969, P 19 30 261.5
Int. Cl. C07c *107/06;* C09b *31/04*
U.S. Cl. 260—186 3 Claims

Disazo dyestuffs, containing 1 sulphonic acid group, of the general formula



wherein

R_1 represents hydrogen, chlorine, bromine or a methyl, ethyl or trifluoromethyl group,

R_2 and R_3 denote hydrogen or independently of one another denote chlorine, bromine or a methyl, ethyl, methoxy or ethoxy group,

R_4 represents hydrogen, chlorine, bromine or a methyl, ethyl, methoxy or ethoxy group or the residue $NHCOC_nH_{2n+1}$, with *n* representing a number from 0 to 4,

R_5 denotes hydrogen or a methyl, methoxy or ethoxy group, and

m represents an integer from 1 to 5.

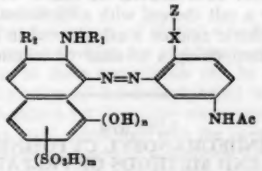
3,709,871

PHENYL-AZO-NAPHTHYL DYESTUFFS

Reiner Ditzer, Cologne, and Horst Nickel, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 6, 1970, Ser. No. 17,311
Claims priority, application Germany, Sept. 3, 1969, P 19 44 699.2
Int. Cl. C07c *107/06;* C09b *29/06, 29/28*
U.S. Cl. 260—199 11 Claims

Monoazo dyestuffs of general formula



(I)

in which Ac represents a non-reactive acyl residue, X represents —O— or —S— and Z represents a carbocyclic aromatic residue, R_1 represents hydrogen or an optionally substituted alkyl, cycloalkyl or aryl residue, R_2 denotes hydrogen or the sulphonic acid group, *m* represents the numbers 0, 1 or 2 and *n* represents the numbers 0 or 1, as well as processes for their manufacture and their use for dyeing nitrogen-containing fibre materials.

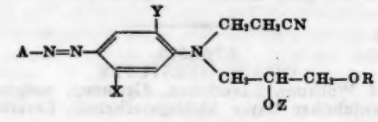
3,709,872

DISPERSIBLE PHENYL-AZO-PHENYL DYESTUFFS

Stefan Koller, Prattein, Basel-Land, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Oct. 24, 1969, Ser. No. 869,380
Claims priority, application Switzerland, Nov. 7, 1968, 16,653/68
Int. Cl. C07c *107/06;* **C09b** *29/08, 29/26*
U.S. Cl. 260—207.1 **12 Claims**

Dyestuffs which are free from water-solubilizing groups dissociating acid in water and corresponding to the formula



wherein A represents the residue of a diazo component of the benzene series having at least one non-ionogenic, electron-attracting substituent or the radical of a diazo component of the heterocyclic series, X and Y represent independently of each other, hydrogen, a lower alkyl group, lower alkanoylamino or halogen, Z represents an acyl radical and R represents an optionally substituted lower alkyl, cycloalkyl, aralkyl or aryl radical. These dyestuffs are distinguished by good affinity especially for polyester fibers, affording dyeings on these fibers which have good fastness properties and especially good fastness to light and sublimation.

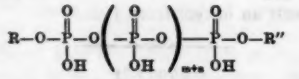
3,709,873

PROCESS FOR SYNTHESIZING THE DI-ESTERS OF CONDENSED PHOSPHORIC ACID

Yasuo Fujimoto, Machida-shi, Japan, assignor to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Filed Apr. 9, 1969, Ser. No. 814,844
Claims priority, application Japan, Apr. 11, 1968, 43/23,707
Int. Cl. C07c *69/32;* **C07d** *51/50*
U.S. Cl. 260—211.5 R **12 Claims**

Die-esters of condensed phosphoric acid having the general formula



wherein both R and R'' represent: organic radicals such as alkyl, cycloalkyl or aryl; sugar residues such as imidazole type-, flavin type-, pyridine type-, pyrimidine type- or purine type- nucleosides, or mono- or oligosaccharides; amino acid residues; vitamin residues; steroid residues and the like; and wherein *m* and *n* represent integers such as 0, 1, 2, 3 and the like, are produced by reacting a mono-ester of mono- or oligo-phosphoramidate or a salt thereof or a di-ester of mono- or oligo-phosphoric acid or a salt thereof with a mono-ester of mono- or oligo-phosphoric acid or a salt thereof in the presence of a solvent comprising a tri-ester or tri-esters of phosphoric acid.

3,709,874

1-β-D-ARABINOFURANOSYL CYTOSINE DERIVATIVES AND METHODS OF PREPARING

John G. Moffatt, Los Altos, and Alan F. Russell, San Francisco, Calif., assignors to Syntex Corporation, Panama, Panama

No Drawing. Filed Mar. 19, 1970, Ser. No. 21,206
Int. Cl. C07d *51/52*
U.S. Cl. 260—211.5 R **30 Claims**

2,2'-anhydro-1-(3'-O-acyl - β - D - arabinofuranosyl) cytosine salt derivatives; (S) 2,2'-anhydro-1-(3'-O-acyl-β-D-arabinofuranosyl) - 2 - thiocytosine salt derivatives; 1-(β-D-arabinofuranosyl) - 5 - azacytosine derivatives and 1-(2'-thio-β-D-arabinofuranosyl) cytosine and methods of preparing such compounds and converting the aforementioned 2,2'-anhydro derivatives to the corresponding 1-β-D-arabinofuranosyl cytosine derivatives. The 2,2'-anhydro-1-(3'-O-acyl-β-D-arabinofuranosyl) cytosine and (S) 2,2' - anhydro - 1 - (3'-O-acyl-β-D-arabinofuranosyl)-2-thiocytosine derivatives are prepared by treating the corresponding cytosine ribonucleosides with a suitable α-acyloxy acid halide. Other pharmaceutically acceptable salts can be prepared by ion exchange. Treatment of these derivatives with an aqueous alkaline solution affords the corresponding 1-(β-D-arabinofuranosyl) cytosine nucleosides. The 2,2'-anhydro-1-(3'-O-acyl-β-D-arabinofuranosyl) cytosine; (S) 2,2'-anhydro-1-(3'-O-acyl-β-D-arabinofuranosyl)-2-thiocytosine and 1-(β-D-arabinofuranosyl)-5-azacytosine derivatives and 1-(2'-thio-β-D-arabinofuranosyl) cytosine exhibit antiviral and cytotoxic activity, and the 2,2'-anhydro derivatives are further useful as intermediates for the preparation of 1-(β-D-arabinofuranosyl) cytosines which also have utility as antiviral and cytotoxic agents.

3,709,875

METHOD OF PREPARING DEXTRAN AND DEXTRAN COMPOUNDS SOLUBLE IN COLD WATER

Henry Marinus Christensen, Frederiksborgvej 107, Roskilde, Denmark

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,681
Claims priority, application Denmark, Nov. 1, 1968, 5,323
Int. Cl. C08b *3/00*
U.S. Cl. 260—209 D **7 Claims**

Dextrans and dextran derivatives which are readily soluble in cold water are produced by adding a sirupy alcohol- or ketone-water mixture of dextran or a dextran derivative to a highly concentrated alcohol or ketone to produce a granular precipitate which is washed with the respective concentrated alcohol or ketone.

3,709,876

WATER SOLUBLE HYDROXYETHYL METHYL CELLULOSE ETHER THICKENER FOR LATEX PAINT

Ronald L. Glomski, Lewis E. Davis, and Joseph A. Grover, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 138,435, Apr. 29, 1971. This application Apr. 10, 1972, Ser. No. 242,477
Int. Cl. C08b *11/08, 21/32*
U.S. Cl. 260—231 A **10 Claims**

New water-soluble hydroxyethyl methyl cellulose ethers have been prepared which are improved thickeners for latex paint. These new ethers have a thermal gel point greater than 100° C., a hydroxyethyl MS of about 1.0–3.5, a methoxy DS of about 0.6–1.6 and a total DS of about 1.4–2.4. Latex paint thickened with these new ethers has improved enzyme resistance and compatibility with predispersed colorants.

3,709,877

PROCESS FOR THE SULFATION OF CELLULOSIC ETHERS

Deger Tunc, Edison, N.J., assignor to Johnson & Johnson

Filed Mar. 7, 1972, Ser. No. 232,371
Int. Cl. C08b *11/20*
U.S. Cl. 260—232 **13 Claims**

A process for manufacturing sulfated alkali cellulose ethers by reacting together cellulosic ethers and sulfating

agents in an organic diluent medium. The reacted mixture is then combined with water to form a mother liquor from which the sulfated cellulose ethers are precipitated. By carefully controlling the concentration parameters of the mother liquor, a product will precipitate which can be cast into a film capable of rapidly dissolving in water. Specifically, the mother liquor should be controlled to maintain a pH of at least about 3.8 and a cation concentration of a prescribed level.

3,709,878

8 ALPHA-METHYL-SUBSTITUTED-STEROIDS

Eugene E. Galantay, Morristown, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed July 20, 1970, Ser. No. 56,743
Int. Cl. C07c *173/10*
U.S. Cl. 260—239.55 12 Claims

8 alpha-methyl-substituted steroids, e.g., 3-methoxy-8 alpha-methylestra-1,3,5(10)-trien-17β-ol, are useful as pharmaceutical agents, and are obtainable from 7,7-dihalo-cyclo[6α,7aα]-B-homogona-1,3,5(10)-trienes.

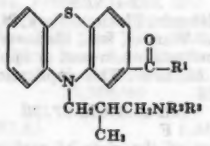
3,709,879

10-(3-DIMETHYLAMINO-2-METHYLPROPYL)-2-VALERYLPHENOTHIAZINE

Shirish Chandubhai Amin, Hornchurch, David Henry Jones, Rayleigh, and Donald Robert Maxwell, Brentwood, England, assignors to May & Baker Limited, Dagenham, Essex, England

No Drawing. Filed Mar. 25, 1970, Ser. No. 22,706
Claims priority, application Great Britain, Mar. 27, 1969, 16,219/69
Int. Cl. C07d *93/14*
U.S. Cl. 260—243 AA 1 Claim

The new phenothiazine derivatives of the formula:



wherein R^1 represents alkyl of 1 through 4 carbon atoms, or cycloalkyl of 3 through 6 carbon atoms, and R^2 and R^3 represent alkyl of 1 through 4 carbon atoms, for example 10-(3-dimethylamino-2-methylpropyl) - 2 - valerylphenothiazine, and their oximes, are useful in the treatment of spasticity without inducing significant undesirable sedative side-effects.

3,709,880

ANTIBIOTIC PURIFICATION PROCESS

Robert T. Goegelman, Linden, and Thomas W. Miller, Carteret, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of abandoned application Ser. No. 19,497, Mar. 13, 1970. This application Dec. 9, 1970, Ser. No. 96,674
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C 8 Claims

Fermentation broths or impure solutions containing 7-(D-5-amino - 5 - carboxyvaleramido)-3-(carbamoyloxymethyl)-7-methoxy-3-cephem-4-carboxylic acid, a substance having antibiotic activity against gram-negative and gram-positive microorganisms, are purified using ion exchange resins or adsorbents such as activated carbon and poly-acrylamide or dextran gels.

3,709,881

PREPARATION OF N-ALKYLMORPHOLINES FROM DIETHYLENE GLYCOL AND ALKYLAMINES

Glenn H. Warner, St. Albans, W. Va., assignor to Union Carbide Corporation

No Drawing. Continuation of application Ser. No. 669,367, Sept. 21, 1967. This application Feb. 19, 1971, Ser. No. 117,061
Int. Cl. C07d *87/24, 87/26*
U.S. Cl. 260—247 18 Claims

The disclosure describes the preparation N-alkyl-morpholines by the reaction of diethylene glycol and an alkyl, dialkyl or trialkylamine in the presence of a hydrogenation catalyst. In the preferred embodiments the reaction is conducted in the presence of hydrogen, at elevated temperatures and pressures in the presence of water.

The examples specifically disclose the reaction of diethylene glycol and diethylamine, ethylamine, triethylamine, and dimethylamine, at about 250° C. and up to about 1500 p.s.i.g. in the presence of hydrogen and a nickel hydrogenation catalyst supported on an inert carrier for the production of N-methyl-morpholine and N-ethylmorpholine.

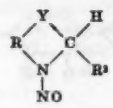
3,709,882

3-NITROSOBENZOXAZINES

Karl Elter, Cologne, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 12, 1970, Ser. No. 19,086
Int. Cl. C07d *87/14, 87/06, 85/26*
U.S. Cl. 260—244 R 2 Claims

Compounds of the formula:



wherein R is bifunctional, aliphatic, aromatic or araliphatic, R^2 is hydrogen, aliphatic, aromatic, heterocyclic, $-(CH_2)_xCHO$, where x is 0–6, or phenyl substituted by CHO, Y is —O—, —COO—, —CONH—, —SO_2—, —SO_2O—, —SO_2NH—, —NR^1—, —CO—NR^1—, or —SO_2NR^1—, wherein R^1 is aliphatic, aryl or heterocyclic are described. The compounds are useful for their molluscocidal activity, and which may be prepared in a single step by reaction of an appropriate amino alcohol, aldehyde and nitrous acid or a compound yielding nitrous acid.

3,709,883

SULFUR CONTAINING DERIVATIVES OF DIALKYL-4-HYDROXYPHENYLTRIAZINE

Martin Dexter, Briarcliff Manor, and Martin Knell, Ossining, N.Y., and Heimo Brunetti, Reinach, Basel-Land, Switzerland, assignors to Ciba-Geigy Corporation, Greenburgh, N.Y.

No Drawing. Filed July 2, 1971, Ser. No. 159,566
Int. Cl. C07d *55/50*
U.S. Cl. 260—248 CS 12 Claims

Novel sulfur derivatives of dialkyl-4-hydroxyphenyltriazine were prepared which are stabilizers of organic material. Certain of these compounds can be prepared (1) by direct alkylation of 2,6-dialkylphenol with a 2,4-bis-(alkylthio)-6-chloro-1,3,5-triazine compound; (2) by the reaction of an alkyl mercaptan with the appropriate 6(3',-5'-dialkyl-4'-hydroxyphenyl)2,4-dichloro-1,3,5-triazine; or (3) by the reaction of an acid chloride of dialkylhydroxybenzoic or phenylalkanoic acid with a mono or dialkyl substituted dithiobiuret. A typical embodiment of this invention is 6(3',5'-di-t-butyl-4'-hydroxyphenyl)-2,4-bis(n-octylthio)-1,3,5-triazine. The compounds of this invention are useful as stabilizers of organic materials which are subject to oxidative and thermal deterioration.

3,709,884

3,5-DIALKYL - 4 - HYDROXYPHENYL ALKANOIC ACID ESTERS OF 2,4,6-TRIS-(ALKANOLAMINO) DERIVATIVES OF TRIAZINE

Martin Dexter, Briarcliff Manor, and David Herbert Steinberg, Bronx, N.Y., assignors to Ciba-Geigy Corporation, Greenburgh, N.Y.

No Drawing. Filed July 1, 1971, Ser. No. 159,022
Int. Cl. C07d 55/50
U.S. Cl. 260—249.6 5 Claims

3,5-dialkyl - 4 - hydroxyphenylalkanoic acid esters of 2,4,6-tris-(alkanolamino) derivatives of s-triazine can be prepared by reacting a 3,5-dialkyl - 4 - hydroxyphenylalkanoic acid with a 2,4,6 - tris-(alkanolamino)-s-triazine. An example of such a compound is 2,4,6-tris-[3'-(3'',5''-di-t-butyl - 4'' - hydroxyphenyl)propionoxyethylamino]-1,3,5-triazine. These compounds are useful as stabilizers of organic substrates subject to oxidative and thermal degradation.

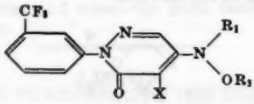
3,709,885

1-(m-TRIFLUOROMETHYLPHENYL)-4 - (N-ALKYL-N-ALKOXY)-AMINO-5-HALO-PYRIDAZONE-(6)

Cuno Ebner, Reinach, and Max Schuler, Arlesheim, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz KG), Basel, Switzerland

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,123
Claims priority, application Switzerland, Dec. 19, 1969, 18,917/69
Int. Cl. C07d 51/04
U.S. Cl. 260—250 A 3 Claims

The invention concerns novel pyridazone compounds of the formula:



wherein

R_1 and R_2 are each alkyl of 1 to 4 carbon atoms, and X is halogen.

Processes for the production of the compounds are also described. The compounds have useful herbicidal activity.

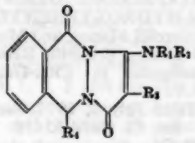
3,709,886

PYRAZOLOPHTHALAZINONE COMPOUNDS AND PROCESS FOR PREPARATION THEREOF

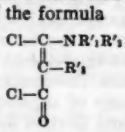
Giangiacomo Nathansohn, Milan, Italy, assignor to Gruppo Lepetit, S.p.A., Milan, Italy

No Drawing. Filed Oct. 14, 1970, Ser. No. 80,775
Int. Cl. C07d 51/06
U.S. Cl. 260—250 A 15 Claims

Pyrazolo[1,2 - b]phthalazine - 1,5(10H)-diones corresponding to the formula



wherein R_1 and R_2 are hydrogen, lower alkyl, halo-lower alkyl, aralkyl, aryl or acyl, R_1 and R_2 taken together with the adjacent nitrogen atom forming a heterocyclic ring containing 1–2 heteroatoms, R_3 is hydrogen, halogen, lower alkyl, aryl and acyl, and R_4 represents hydrogen, lower alkyl or aryl are disclosed. The compounds are prepared by reacting a corresponding 3,4-dihydro-1(2H)-phthalazinone with an unsaturated carboxylic acid acyl chloride derivative of the formula



wherein R'_1 and R'_2 are the same as R_1 and R_2, except that hydrogen and acyl are excluded, and R'_3 represents halogen, lower alkyl and aryl. The process is carried out in an inert organic solvent in the presence of a tertiary amine. The new compounds of the present invention are suitable for use as anti-inflammatory, analgesic and antipyretic agents.

3,709,887

1-SUBSTITUTED - 5,6 - DIHYDRO - 7H-PYRIDO (3,2,1-ij)QUINAZOLIN-3(3H)-ONES AND THEIR PREPARATION

George A. Cooke, Denville, and William J. Houlihan, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of abandoned application Ser. No. 13,817, Feb. 24, 1970. This application Dec. 8, 1971, Ser. No. 206,156
Int. Cl. C07d 51/48
U.S. Cl. 260—251 A 15 Claims

Disclosed are compounds of the general class of 1-aryl-5,6-dihydro - 7H - pyrido[3,2,1-ij]quinazolin-3(3H)-ones including compounds which are 1-aryl-5,6-dihydro-7H-pyrido[3,2,1-ij]quinazolin-3-(3H)-ones, and compounds which are 1-aryl-1,2,5,6-tetrahydro-7H-pyrido[3,2,1-ij] quinazolin-3(3H)-ones. The 5,6-dihydro compounds are prepared by oxidation of the corresponding 1,2,5,6-tetrahydro compounds and the latter are prepared by reaction of a 2,3-dihydro-1(4H)-quinoline-carboxamide with an appropriately substituted or unsubstituted aromatic aldehyde. The pyrido[3,2,1-ij]quinazolin-3(3H)-ones have pharmacological activity in animals and are useful as sedatives, analgesics or anti-inflammatory agents. The quinoline-carboxamide are useful as sedatives and are prepared by reacting the corresponding quinoline with isocyanic acid.

3,709,888

ARYL-SUBSTITUTED-PYRIDO[2,3-d]PYRIMIDIN-2-ONES

Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 870,445, Oct. 20, 1969. This application June 1, 1970, Ser. No. 42,538
Int. Cl. C07d 57/20
U.S. Cl. 260—256.4 F 16 Claims

Compounds are of the class of aryl-substituted-1-substituted-4-aryl-pyrido[2,3-d]pyrimidin-2-ones, which are useful as anti-inflammatory agents. Intermediates for preparation include the corresponding 1-unsubstituted-4-aryl-pyrido[2,3-d]pyrimidin-2-ones, compounds which are pyridyl-phenyl ketone imines and compounds which are aryl-substituted-2-amino-nicotinonitriles of which the latter are also useful as anti-inflammatory agents.

3,709,889

AMINOETHANESULFONYL PIPERIDINE AND PYRROLIDINE

Shun-Ichi Naito, 35 Murasakino Kamitoridacho, Kita-ku, Kyoto, Japan

No Drawing. Filed Mar. 9, 1970, Ser. No. 17,969
Claims priority, application Japan, May 8, 1969, 44/35,435, 44/35,436, 44/35,437
Int. Cl. C07d 29/34
U.S. Cl. 260—293.85 3 Claims

Stable, water-soluble aminoethanesulfonyl derivatives having analgesic activity or antilipemic action are described. They are prepared by ammonolysis of the corresponding halides, preferably under high pressure in the presence of a catalyst, or by deacylation of the corresponding acylamino or acylimino compound, or by nicotinoylation of an amino compound.

3,709,890

PROCESS FOR THE PREPARATION OF DIMERIC IMINES AND PYRROLES

John Charles Leffingwell, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

No Drawing. Continuation-in-part of application Ser. No. 759,750, Sept. 13, 1968, which is a continuation-in-part of application Ser. No. 595,001, Nov. 17, 1966. This application Apr. 9, 1970, Ser. No. 27,173

Int. Cl. C07d *27/20;* C07c *119/00*

U.S. Cl. 260—283 R 8 Claims

The production of dimeric imines (Schiff bases) and pyrroles from monomeric imines by treating monomeric imines with manganese dioxide, nickel peroxide or lead dioxide.

3,709,891

MANUFACTURE OF LYSERGOLS

Eckart Eich, Marienborn, and Hans Rochelmeyer, Mainz, Germany (both % Farbwerke Hoechst AG, Frankfurt am Main, Germany)

No Drawing. Filed June 24, 1970, Ser. No. 49,564

Claims priority, application Germany, July 12, 1969, P 19 35 556.7

Int. Cl. C07d *43/20*

U.S. Cl. 260—285.5 5 Claims

Method for making lysergol or N_1-lower alkyl lysergols from elymoclavine or N_1-lower alkyl elymoclavine by heating in an organic solvent in the presence of activated aluminum oxide alone, or in the presence of aluminum oxide or charcoal in combination with certain metal oxides or certain noble metals.

3,709,892

ALKYLPHENOXY-ALKYLAMINES AS GASTRIC ANTISECRETORY AGENTS

Peter R. Leeming, Peter E. Cross, and David A. Cox, Canterbury, and Joachim Augstein, Linford, England, assignors to Pfizer Inc., New York, N.Y.

No Drawing. Filed June 8, 1970, Ser. No. 44,604

Claims priority, application Great Britain, June 12, 1969, 29,780/69

Int. Cl. C07d *29/18*

U.S. Cl. 260—293.83 17 Claims

Novel ortho-substituted phenoxyalkylamines having gastric antisecretory activity are prepared. A typical embodiment is N,N-diethyl-2[2-(2-cyclohexylethyl)phenoxy] ethylamine.

3,709,893

HYDROXYISOQUINUCLIDINE DERIVATIVES

Luigi Bernardi, Cesare Bertazzoli, and Tecla Chieli, Milan, and Paolo Maggioni, Montevecchia (Como), Italy, assignors to Societa Farmaceutici Italia, Milan, Italy

No Drawing. Filed July 30, 1970, Ser. No. 59,747

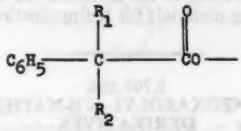
Claims priority, application Italy, July 29, 1969, 20,217/69

Int. Cl. C07d *39/00*

U.S. Cl. 260—293.54 12 Claims

Esters of 6-hydroxy and 6-hydroxyisoquinuclidines substituted in the 2-position having the formula:

wherein R is a lower alkyl or aralkyl; X and X_1 are different and are selected from the group consisting of hydroxy and an α-substituted phenylacetoxy radical of the formula:



wherein R_1 is selected from the group consisting of hydrogen and hydroxy group; R_2 is selected from the group consisting of aryl and cycloalkyl. The invention includes the corresponding pharmaceutically acceptable quaternary nitrogen derivatives and salts with organic or inorganic acids, as well as the preparation thereof. The compounds are therapeutically useful.

3,709,894

THIENO[3,4-b]PYRIDINE AND THIENO[3,4-c] PYRIDINE

Le Roy H. Klemm, Eugene, Oreg., Wayne O. Johnson, Hatboro, Pa., and Danny V. White, Sacramento, Calif., assignors to Research Corporation, New York, N.Y.

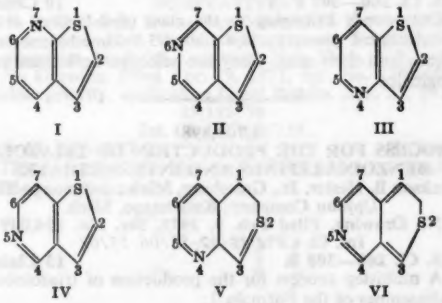
No Drawing. Filed Feb. 11, 1971, Ser. No. 114,671

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 C 4 Claims

Thieno[3,4-b]pyridine and thieno[3,4-c]pyridine have been prepared.

There are six theoretically possible thienopyridines, viz thieno[2,3-b]pyridine (I), thieno[2,3-c]pyridine (II), thieno[3,2-b]pyridine (III), thieno[3,2-c]pyridine (IV), thieno[3,4-b]pyridine (V) and thieno[3,4-c]pyridine (VI).



Of the above-identified compounds only I, II, III and IV have been previously prepared, see for example, L. H. Klemm, C. E. Klopfenstein, R. Zell, D. R. McCoy and R. A. Klemm, J. Org. Chem., 34, 347 (1969) and L. H. Klemm, J. Shabtai, D. R. McCoy and W. K. T. Kiang, J. Heterocyclic Chem., 5, 883 (1968).

3,709,895

PRODUCTION OF 5-METHYLENE-2,4-OXAZOLIDINEDIONES

Reinhold Kohlhaupt, Frankenthal, and Friedrich Becke, Heidelberg, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Sept. 16, 1970, Ser. No. 72,867

Claims priority, application Germany, Sept. 18, 1969, P 19 47 193.3

Int. Cl. C07d *85/34*

U.S. Cl. 260—307 B 9 Claims

The production of 5-methylene-2,4-oxazolidinediones by cyclization of β-aminolactamideurethanes at elevated

temperature, and the new 5-methylene-2,4-oxazolidinediones. The new compounds which can be prepared by the process according to the invention are fungicides and valuable starting materials for the production of dyes and pesticides.

3,709,896
1,4-BIS-[BENZOXAZOLYL-(2')]-NAPHTHALENE DERIVATIVES

Hans Frischkorn, Hofheim, Taunus, and Ulrich Pintschovius and Horst Behrenbruch, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Continuation-in-part of application Ser. No. 655,768, July 25, 1967. This application Sept. 29, 1970, Ser. No. 76,622
Claims priority, application Germany, July 27, 1966, F 49,793; July 6, 1967, F 52,873
Int. Cl. C07d *85/48*
U.S. Cl. 260—307 D **8 Claims**

1,4 - bis-[benzoxazolyl-(2')]-naphthalenes having carboxy or carboxylic acid ester groups on the benzoxazole groups, which compounds are excellent optical brighteners, especially for polyamides and polyesters.

3,709,897
2-ARYL-4,4-DIALKYL-5-HALOMETHYLENE-OXAZOLINES

Patrick J. McNulty, Wyndmoor, Colin Swithenbank, Perkasie, Kenneth L. Viste, Warminster, and William C. von Meyer, Willow Grove, Pa., assignors to Rohm & Haas Company, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 829,084, May 29, 1969. This application Apr. 19, 1971, Ser. No. 135,450
Int. Cl. C07d *85/36*
U.S. Cl. 260—307 F **10 Claims**

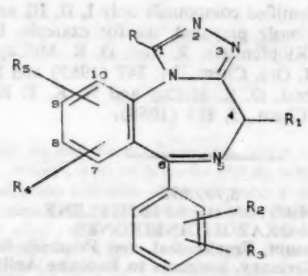
Compounds belonging to the class of 2-(mono, di or tri-substituted phenyl) - 4,4-dialkyl-5-halomethylene-oxazolines and their salts. They are selective herbicides and fungicides.

3,709,898
PROCESS FOR THE PRODUCTION OF TRIAZOLO-BENZODIAZEPINES AND INTERMEDIATES

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Feb. 9, 1971, Ser. No. 114,049
Int. Cl. C07d *33/52, 55/06, 57/02*
U.S. Cl. 260—308 R **13 Claims**

A multistep process for the production of triazolobenzodiazepines of the Formula 1:



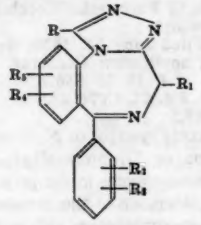
wherein R is selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, inclusive; wherein R_1 is hydrogen or alkyl defined as above; and wherein R_2, R_3, R_4, and R_5 are selected from the group consisting of hydrogen, alkyl defined as above, fluorine, chlorine, bromine, nitro, cyano, trifluoromethyl, alkoxy of 1 to 3 carbon atoms, inclusive, amino, alkanoylamino in which the alkanoyl group is of 1 to 3 carbon atoms, inclusive, alkylthio, in which the alkyl group is defined as above, alkylsulfinyl, in which the alkyl group is defined as above, and dialkylamino, in which the alkyl group is defined as above, and for some of intermediates is claimed. The final compounds and intermediates are transquilizers and sedatives and are useful in mammals, including man and birds.

3,709,899
6-PHENYL-4H-s-TRIAZOLO[4,3-a][1,4]BENZODIAZEPINES AND THEIR PRODUCTION

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Apr. 28, 1971, Ser. No. 138,291
Int. Cl. C07d *57/02*
U.S. Cl. 260—308 R **19 Claims**

1-substituted - 6 - phenyl - 4H - s - triazolo[4,3-a][1,4] benzodiazepines of the Formula VI:

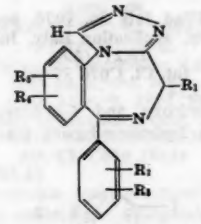


VI

wherein R is selected from the group consisting of chlorine, bromine, cyano, OR' in which the alkyl group R' is of 1 to 3 carbon atoms, inclusive, and

in which R'' and R''' are alkyl groups defined as above or together

represent pyrrolidino, piperidino, and morpholino; wherein R_1 is selected from the group consisting of hydrogen and alkyl, as defined above; and wherein R_2, R_3, R_4, and R_5 are selected from the group consisting of hydrogen, alkyl, as defined above, dialkylamine, in which alkyl is defined as above, fluoro, chloro, bromo, nitro, cyano, trifluoromethyl, and alkoxy, alkylthio, alkylsulfinyl, and alkylsulfonyl, in which the carbon chain moieties are of 1 to 3 carbon atoms, inclusive, are produced by heating a 4H-s-triazolo[4,3-a][1,4]benzodiazepine:



I

wherein R_1, R_2, R_3, R_4, and R_5 are defined as above, with a N-halosuccinimide (chloro or bromo) to give the compound II (or VI in which R is chlorine or bromine). The compound IIa (R of VI is bromo) gives with cuprous cyanide the compound III (R=CN), with sodium alkoxide

IV (R=OR' R' defined as above); and with a secondary amine the compound V

in which R'' and R''' are alkyl, defined as above or

are pyrrolidino, piperidino and morpholino.

The new products of Formula VI including their pharmacologically acceptable acid addition salts are useful as sedatives, transquillizers, and muscle relaxants in mammals and birds.

3,709,900

4,5-DICYANO-2H-IMIDAZOLES

Donald Ray Hartter, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 14, 1971, Ser. No. 106,573
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 **7 Claims**

Diiminosuccinonitrile reacts with aldehydes to give 2-substituted - 4,5 - dicyanoimidazoles and with methyl ketones to give 2 - methyl - 2 - substituted - 4,5 - dicyano-2H-imidazoles in the presence of an acid catalyst. Acetals can be employed in place of the ketones or aldehydes in this process. The 2 - substituted - 4,5 - dicyanoimidazoles are known compounds which are useful as chemical intermediates. The 2 - methyl - 2 - alkyl - 4,5 - dicyano-2H-imidazoles are useful in protecting plants from soil fungi.

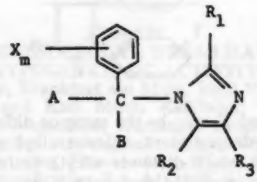
3,709,901

SUBSTITUTED N-BENZYLIMIDAZOLES

Wilfried Draber, Wuppertal-Elberfeld, Erik Regel, Wuppertal-Cronenberg, and Karl-Heinz Büchel and Manfred Plempel, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 4, 1970, Ser. No. 16,219
Claims priority, application Germany, Mar. 7, 1969, P 19 11 646.2
Int. Cl. C07d *99/02*
U.S. Cl. 260—310 R **9 Claims**

Substituted N-benzylimidazoles of the formula:



wherein

R_1, R_2 and R_3 are each hydrogen, straight or branched chain lower alkyl or straight or branched chain lower alkenyl,

X is hydrogen, lower alkyl, lower alkoxy, lower alkylmercapto, lower alkenylmercapto, trifluoromethyl, halogen, nitro, cyano, amino or amino substituted by 1 or 2 aliphatic moieties,

m is 1 or 2,

A is phenyl, substituted phenyl, pyridyl, lower alkyl or cycloalkyl,

B is a 5-membered heteroaromatic ring of the formula:

wherein

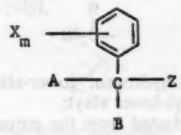
D is CH or N,

E is oxygen, sulphur, N-lower alkyl or N-aryl,

Y is hydrogen, 1 or 2 lower alkyls, 1 or 2 halogens, aryl or substituted aryl, and

n is 1 or 2,

are produced by reacting a compound of the formula:



wherein A, B, X and *m* are as above defined and Z is chlorine or bromine, with at least the theoretically necessary amount of imidazole, optionally in the presence of an acid acceptor, in a polar organic solvent, at a temperature of from 20° C. to 150° C. These substituted N-benzylimidazoles are useful as antimycotics and are effective against both yeasts and dermatophytes. These compounds are effective against a wide range of fungi pathogenic to humans and animals.

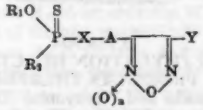
3,709,902

PHOSPHORYLATED 1,2,5-OXADIAZOLE DERIVATIVES

Clive B. C. Boyce, Herne Bay, Michael D. Barker, Maidstone, and Jack Wood, Sittingbourne, England, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Apr. 19, 1971, Ser. No. 135,390
Claims priority, application Great Britain, Apr. 22, 1970, 19,192/70
Int. Cl. C07d *85/56*
U.S. Cl. 260—307 G **5 Claims**

This invention provides pesticidally active compounds of the general formula:



wherein the various symbols have the respective meanings described in the specification. A representative compound is 3-(dimethoxyphosphinothioylthiomethyl) - 4 - methyl-1,2,5-oxadiazole.

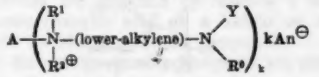
3,709,903

WATER-SOLUBLE QUATERNARY AMMONIUM PHTHALOCYANINE DYESTUFFS

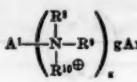
Patrick J. Jefferies, Erlanger, Ky., and Nathan N. Crounse, Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 777,884, Nov. 21, 1968, which is a continuation-in-part of application Ser. No. 551,868, May 23, 1966. This application July 1, 1970, Ser. No. 51,676
Int. Cl. C09b *47/04, 47/06;* D21h *1/46*
U.S. Cl. 260—314.5 **14 Claims**

Water-soluble cationic dyestuffs of the formulae



and



wherein

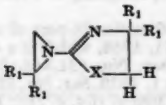
R^0 is hydrogen, lower-alkyl or hydroxy-lower-alkyl;
R^1 is lower-alkyl, lower-alkenyl or hydroxy-lower-alkyl;
R^2 is lower-alkyl, lower-alkenyl, hydroxy-lower-alkyl or -(lower-alkylene)-NR^0Y or R^1 and R^2 together with the nitrogen atom, are pyrrolidino, piperidino or 4-lower-alkanoyl piperazino;
Y is hydrogen or

wherein R is hydrogen, lower-alkyl, lower-alkenyl, phenyl or phenyl-lower alkyl;
A is a member selected from the group consisting of (1) a phthalocyanine dyestuff residue attached to the quaternary ammonium nitrogen atom through a methylene bridge or (2) an aromatic azo dyestuff residue attached to the quaternary ammonium nitrogen atom through a lower-alkylene bridge;
k is a small integer whose value is dependent on the nature of A such that it has a range from one to two when A is an aromatic azo dyestuff residue as described above and a range from one to five when A is a phthalocyanine residue as described above;
R^8 is lower-alkyl, lower-alkenyl or hydroxy-lower-alkyl;
R^9 is lower-alkyl or hydroxy-lower-alkyl;
R^{10} is lower-alkyl or lower-alkenyl;
A^1 is an aromatic azo dyestuff residue attached to the quaternary ammonium nitrogen atom through a lower-alkylene bridge;
g is a small integer whose value is dependent on the nature of A^1 such that it has a range from one to two; and
An is an anion

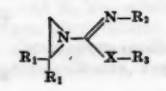
are particularly useful for coloring natural fibers, synthetic fiber-forming materials and cellulosic materials.

3,709,904
AMINOETHYLATION REACTION AND PRODUCTS THEREOF
Donald A. Tomalia and Narayanlal D. Ojha, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed June 18, 1969, Ser. No. 834,562
Int. Cl. C07d *85/36*
U.S. Cl. 260—307 F **5 Claims**

An aminoethyl derivative of a primary or secondary alcohol is prepared in the reaction between (1) a primary or secondary alcohol and (2) a molecular complex of SO_2 and an aziridine having the structural formula



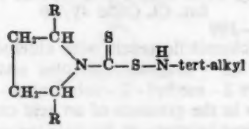
or



wherein R_1–R_3 are inert hydrocarbon radicals and X is oxygen or sulfur. The aminoethylated reaction products, after the SO_2 is removed, contain basic amino groups and are useful in neutralizing acids, abstracting acidic gases from flue gas, and as curing agents for epoxy resins.

3,709,905
N-TERT-ALKYLAMINO PYRROLIDINYLTHIO-CARBONYL SULFIDES
Gene R. Wilder, Medina, Ohio, assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed June 8, 1970, Ser. No. 44,658
Int. Cl. C07d *27/04*
U.S. Cl. 260—326.83 **3 Claims**

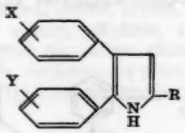
A compound of the formula



where R is hydrogen or lower alkyl which is useful for accelerating the vulcanization of diene rubber.

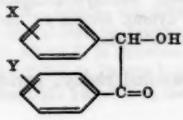
3,709,906
2-ALKYL-4,5-DIPHENYLPYRROLE DERIVATIVES
Norio Yoshida, Kuniyuki Tomita, and Yoshio Iizuka, Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan
No Drawing. Filed July 18, 1969, Ser. No. 17,359
Claims priority, application Japan, July 26, 1968, 43/52,832; Apr. 19, 1969, 44/30,491; June 16, 1969, 44/47,486
Int. Cl. C07d *27/22*
U.S. Cl. 260—326.5 M **9 Claims**

Novel 2-alkyl-4,5-diphenylpyrrole derivatives of the formula



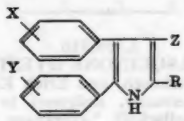
wherein X and Y may be the same or different and each represents hydrogen atom, a lower alkyl group, a lower alkoxy group, an N-di(lower alkyl) amino group of a halogen atom, provided that both X and Y are not hydrogen atom, and R represents a lower alkyl group.

The products have pharmacological properties and are useful as anti-inflammatory agents and prepared by reacting a benzoin derivative having the formula



wherein X and Y are as defined above with ammonia and a keto-compound having the formula

wherein R is as defined above and Z represents an esterified carboxyl group, cyano group or a carbamoyl group which may be substituted with alkyl or phenyl to produce a 3-substituted pyrrole derivative having the formula



wherein X, Y, R and Z are as defined above and heating the product with an acid or an alkali substance.

3,709,907
DITHIOAMIDES

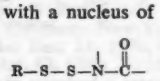
Mohammad Behforouz, Charleston, W. Va., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Original application June 5, 1967, Ser. No. 643,401, now Patent No. 3,539,538, dated Nov. 10, 1970. Divided and this application Jan. 12, 1970, Ser. No. 7,436

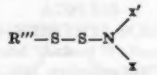
Int. Cl. C07d *27/10, 27/52*

U.S. Cl. 260—326 S **8 Claims**

New compounds with a nucleus of



where the dangling valence on the nitrogen is linked to a second carbonyl, alkyl, aryl, cycloalkyl, hydrogen, alkylene carbon, or arylene carbon and R is alkyl, aryl, or cycloalkyl are inhibitors of premature vulcanization of diene rubbers. Compounds of the formula



where x is cycloalkyl, alkyl, aryl, or hydrogen and x' is cycloalkyl, alkyl, or aryl; or x and x' together with the N atom form a heterocyclic amine; and R''' is aryl, alkyl, or cycloalkyl are also inhibitors of premature vulcanization of diene rubbers. A combination of a vulcanization accelerator and an inhibitor of this invention is an improved rubber additive which allows longer and safer processing time for rubber.

3,709,908
BENZENESULFONYL UREAS HAVING HYPOGLYCEMIC ACTIVITY

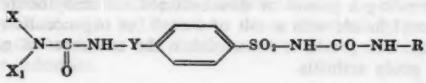
Helmut Weber, Frankfurt am Main, Rudi Weyer, Walter Aumuller, and Karl Muth, Kelkheim, Taunus, and Kurt Stach, Mannheim, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Application Feb. 14, 1969, Ser. No. 799,534, now Patent No. 3,655,756, dated Apr. 11, 1972, which is a continuation-in-part of applications Ser. No. 511,990, Dec. 6, 1965, and Ser. No. 636,290, May 5, 1967, both now abandoned. Divided and this application Oct. 7, 1970, Ser. No. 78,984

Int. Cl. C07d *27/38, 33/10*

U.S. Cl. 260—326.11 **5 Claims**

Benzenesulfonyl urea compounds that are effective as oral antidiabetic agents are disclosed to have the formula



wherein R is

(a) alkyl or alkenyl of 3–6 carbon atoms,
(b) endoalkylene-cyclohexyl, endoalkylene-cyclohexenyl, endoalkylene-cyclohexylmethyl or endoalkylene-cyclohexenylmethyl of 1–2 endoalkylene carbon atoms,
(c) benzyl, phenylethyl,
(d) cyclohexyl methyl,
(e) lower alkyl cyclohexyl or dialkyl cyclohexyl, methyl cyclopentyl,
(f) cycloalkyl of 5–8 carbon atoms in the ring
(g) cyclohexenyl, cyclohexenyl-methyl, methylcyclohexenyl, or
(h) nortricyclyl,

is indolino or tetrahydroquinolino, and
Y is alkylene of 1 to 3 carbon atoms.

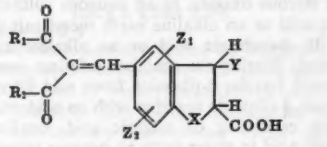
3,709,909
DERIVATIVES OF 2,3-DIHYDRO-BENZOTHIOPHENE AND BENZOFURAN-2-CARBOXYLIC ACIDS

Ernst Habicht, Oberwil, Basel-Land, Switzerland, Bernard Libis, Saint-Louis, France, and Janos Zergenyi, Riehen, Basel, Switzerland, assignors to Ciba-Geigy Corporation

No Drawing. Filed Sept. 10, 1970, Ser. No. 72,873

Int. Cl. A61k *27/00;* **C07d** *63/22, 5/34*

U.S. Cl. 260—330.5 **3 Claims**



(I)

wherein X is oxygen or sulfur; Y is hydrogen or methyl; Z is chloro, fluoro, methyl or methoxy; Z_2 is hydrogen or methyl; and R_1 and R_2 independently of each other are methyl or ethyl; and the pharmaceutically acceptable salts thereof with a base have diuretic and saluretic effects; these compounds are active ingredients of pharmaceutical compositions and are useful for the treatment of disturbances caused by deficient elimination of electrolytes; a typical embodiment is 2,3 - dihydro-5-(2-acetyl-3-oxo-1-butenyl)-6-chloro-benzo[b]thiophene-2-carboxylic acid.

3,709,910
CYCLOPROPANECARBOXYLIC ACID ESTERS

Masano Matsui, Tokyo, Takeaki Kato, Nishinomiya-shi, Kenzo Ueda, Saitama-ken, Toshio Mizutani, Ikeda-shi, Shigeyoshi Kitamura, Minoo-shi, Keimei Fujimoto, Kyoto, and Yositosi Okuno, Nishinomiya-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Aug. 21, 1967, Ser. No. 661,841
Claims priority, application Japan, Aug. 24, 1966, 41/55,973; Aug. 25, 1966, 41/56,158

Int. Cl. C07d *27/56*

U.S. Cl. 260—326 A **17 Claims**

New cyclopropanecarboxylic acid esters having insecticidal properties are obtained by reacting a substituted cyclopropanecarboxylic acid or a halide or anhydride thereof with an N-methylolated compound.

Further, the cyclopropanecarboxylates are obtained by reacting an alkali metal salt, ammonium salt or organic

tertiary amine salt of a substituted cyclopropanecarboxylic acid with an N-halogenomethylimide compound.

The new cyclopropanecarboxylic acid esters have excellent insecticidal properties which are superior to chrysanthemumic acid esters, which have heretofore been used as insecticides, and are usable as strong, multi-purpose insecticides in admixture with common diluents for insecticides and with other insecticides.

3,709,911

[(THENYLIDENE AMINO)OXY] ALKYL CARBOXYLIC ACIDS AND SALTS AND ESTERS THEREOF

Jan van Dijk and Johannes Maria Antonius Zwagemakers, van Houtenlaan, Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Apr. 8, 1970, Ser. No. 26,756
Claims priority, application Netherlands, Apr. 10, 1969, 6905499
Int. Cl. A61k *27/00*; C07d *63/12, 63/14*
U.S. Cl. 260—332.2 A 7 Claims

Certain [(thenylidene amino) oxy] alkyl carboxylic acids their esters and salts have been found to have strong anti-inflammatory activities and analgetic activities.

3,709,912

PROCESS FOR PREPARING d-RIBONOLACTONE

Ryuji Tanaka, Tokyo, and Akio Yasuno, Narashino-shi, Japan, assignors to Tokyo Tanabe Company, Limited, Tokyo, Japan

No Drawing. Filed Mar. 13, 1969, Ser. No. 807,065
Int. Cl. C07d *5/06*
U.S. Cl. 260—343.6 8 Claims

Process for preparing d-ribonolactone which includes the steps of adding one member selected from the group consisting of iron powder, ferrous hydroxide, ferrous sulfate and ferrous oxalate, to an aqueous solution wherein d-ribonic acid or an alkaline earth metal salt thereof coexists with d-arabonic acid or an alkaline earth metal salt thereof, filtering the reaction solution, removing the thus formed ferrous d-ribonate from said filtrate, adding said ferrous d-ribonate together with an acid selected from the group consisting of sulfuric acid, oxalic acid and phosphoric acid to water or to an organic solvent, heating the resultant mixture to form free d-ribonic acid and the co-product iron salt of said acid therein, removing the co-product iron salt of said acid therefrom to obtain a solution of free d-ribonic acid, and concentrating said solution so as to lactonize said d-ribonic acid.

3,709,913

N-THIENYLALKYL-β-ALKOXY-TRIFLUOROMETHYLPHENALKYLAMINES

John J. Lafferty, Levittown, and Charles L. Zirkle, Berwyn, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed Sept. 14, 1970, Ser. No. 72,111
Int. Cl. A61k *27/00*; C07d *63/12*
U.S. Cl. 260—332.3 R 8 Claims

N - thienylalkyl - β - alkoxy-trifluoromethylphenalkylamines having anorectic activity are prepared by condensation of an N-thienylalkylamine with a β-alkoxy-trifluoromethylphenalkyl halide.

3,709,914

METHYLENEDIOXYPHENYL COMPOUNDS

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed July 30, 1970, Ser. No. 59,762
Int. Cl. C07d *13/10*
U.S. Cl. 260—340.5 27 Claims

Novel methylenedioxyphenyl compounds of Formulas I, II, III and IV and intermediates useful for control of insects.

3,709,915

SESAMOLYL AND PIPERONYL ETHERS AND THIOETHERS

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed Dec. 31, 1970, Ser. No. 103,278
Int. Cl. C07d *13/10*
U.S. Cl. 260—340.5 8 Claims

Esters of phenyl ethers and phenyl thioethers useful for the control of insects.

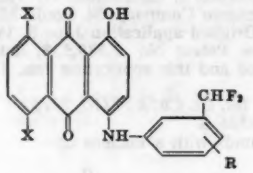
3,709,916

ANTHRAQUINONE DYESTUFFS

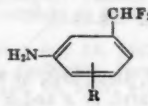
Rutger Neeff, Leverkusen, and Erich Klauke, Odenthal-Hahnenberg, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 13, 1970, Ser. No. 19,461
Claims priority, application Germany, Mar. 19, 1969, P 19 13 840.0
Int. Cl. C09b *1/50*
U.S. Cl. 260—380 1 Claim

Dyestuff of the formula



in which one X denotes a hydroxy group, the other X is an amino or nitro group, and R stands for a hydrogen atom or a chlorine atom, as well as a process for the production of these dyestuffs characterised in that 4,8-dinitro-1,5-dihydroxy-anthraquinone and/or 4,5-dinitro-1,8-dihydroxy-anthraquinone is heated with anilines of the formula



(R=H, Cl)

optionally in the presence of inert organic diluents, at temperatures of about 100–220° C., and the nitro group containing resultant dyestuffs are optionally reduced in known manner.

3,709,917

N-ACYL AND N-ORGANOSULFONYL MONO- OR DI-SUBSTITUTED SULFAMOYLBENZENESULFONAMIDES

Carl Ziegler, Glenside, and James M. Sprague, Gwynedd Valley, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Sept. 26, 1969, Ser. No. 870,380
Int. Cl. C07d *5/16*; C07c *193/78*
U.S. Cl. 260—347.2 13 Claims

N-acyl and N-organosulfonyl mono-substituted or di-substituted sulfamoylbenzenesulfonamides and salts thereof wherein the benzene ring may be substituted by halo, alkyl, trihalo lower alkyl, nitro, cyano, carboxy or a hydrocarbylene moiety. The products are prepared by either of two routes: (1) by treating a mono- or di-substituted sulfamoylbenzenesulfonamide with an acyl halide (or organosulfonyl halide) or with a carboxylic acid anhydride (or organosulfonic acid anhydride), or (2) by treating a mono- or di-substituted sulfamoylbenzenesulfonyl halide with a salt of a acyl (or organosulfonyl) amide. The products are useful in the treatment of gout and gouty arthritis.

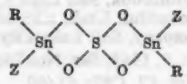
3,709,918

BIS (MONOALKYLTIN) ORTHOSULFITES

Christian H. Stapfer, Newtown, Pa., assignor to Cincinnati Milacron Chemicals Inc., Reading, Ohio

Filed March 24, 1971, Ser. No. 127,790
Int. Cl. C07f 7/22, 45/56
U.S. Cl. 260—429.7 12 Claims

Bis (monoalkyltin) orthosulfites, of the formula



wherein R is an alkyl preferably having one to 12 carbon atoms and Z is hydroxy or a monovalent or divalent organic radical bonded to the tin through an oxygen or sulfur atom and can be prepared by oxidation of monoalkylthiostannoic acids with organic hydroperoxides, optionally followed by condensation with various functional groups. These novel orthosulfites are useful as condensation, polycondensation and polymerization catalysts; as fungicides, bactericides and stabilizers for synthetic polymers.

3,709,919

PRODUCTION OF METHANOL

Eugene F. Magoon, Walnut Creek, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Dec. 21, 1970, Ser. No. 100,399
Int. Cl. C07c 29/16
U.S. Cl. 260—449.5 4 Claims

Methanol is produced by reaction of carbon oxides and hydrogen in the presence of a copper-zinc-silver containing oxide catalyst.

3,709,920

METHYLENE-O,O'-BIS(ETHYLACETHYDROXIMATE)

Curtis S. McDowell, and Michael W. Barnes, both of Edwards Air Force Base, Calif., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 3, 1969, Ser. No. 882,758
Int. Cl. C07c 85/04, 87/00
U.S. Cl. 260—453 R 4 Claims

A method for synthesizing the novel compound, methylene-O,O'-bis(ethylacethydroximate) by effecting a reflux reaction between (1) a metal salt of ethyl acethydroximate and (2) a disubstituted halo-methane.

3,709,921

METHOD OF FORMING DICYANO COMPOUNDS

William C. Baird, Jr., Westfield, and John H. Surridge, Scotch Plains, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed Sept. 3, 1969, Ser. No. 855,025
Int. Cl. C07c 121/26
U.S. Cl. 260—465.3 9 Claims

Dicyano compounds are prepared by reacting a conjugated diolefin and cuprous cyanide with molecular iodine or cupric bromide in the presence of an inert aliphatic, aromatic, or chlorocarbon diluent, e.g., carbon tetrachloride. The preparation of dicyano compounds in inert hydrocarbon or chlorocarbon diluents leads to isolation of the dicyano compounds as a cuprous halide complex and thus makes possible the regeneration and recycle of the diluent and metal salts employed in the reaction mixture. Dicyano compounds may be converted to dibasic acids by hydrolysis or to diamines by hydrogenation and thus find use in both the chemical and polymer industries.

3,709,922

O-LOWER ALKANOYL OXIMES OF CYANOACETALDEHYDE

Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed June 1, 1970, Ser. No. 42,545
Int. Cl. C07c 121/30
U.S. Cl. 260—465.4 5 Claims

This invention is directed to a process for the preparation of maononitrile and cyanoacetamide from the reaction product of a dialkyl acetal of a dialkyl formamide and acetonitrile including intermediates therein.

3,709,923

CONVERSION OF ALDEHYDES TO ESTERS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed July 13, 1970, Ser. No. 54,655
Int. Cl. C07c 67/00
U.S. Cl. 260—468 R 9 Claims

An aldehyde having not more than one hydrogen atom bonded to any carbon atom adjacent to the aldehyde group and wherein the alpha carbon atom, if any, is not olefinically unsaturated, is heated in the presence of a boron containing compound to produce an ester.

3,709,924

ELASTOMER HAVING IMPROVED BUILDING TACK

Robert Edward Tarney, Chadds Ford, Pa., and John J. Verbanc, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original application Oct. 30, 1968, Ser. No. 771,996. Divided and this application Dec. 4, 1970, Ser. No. 95,387
Int. Cl. C08d 9/08
U.S. Cl. 260—470 P 3 Claims

An EODM elastomer is tackified by uniformly mixing with a hydroxylated-, carboxylated- or phenolated isoprenoidal resin formed by copolymerization of isoprene with piperylene. The resin may further include an allylically terminated ethylenically unsaturated cyclic compound, for example the reaction product of cyclopentadiene and alpha-methyl styrene or 2 methyl-butene-2.

3,709,925

ACETYLENIC CARBAMATES

Kenneth Bowden, Bramfield, Robin Alastair Davis, Cookham, Derek William Hills, Welwyn Garden City, and George Sidney Sach, Welwyn, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, County of Hertford, England

No Drawing. Filed Dec. 22, 1969, Ser. No. 887,350
Claims priority, application Great Britain, Dec. 10, 1968, 58,730/68
Int. Cl. C07c 101/00
U.S. Cl. 260—471 C 11 Claims

The compounds are 4 - methyl or ethyl - 4 - (N-phenyl or N - 2 - phenylcyclopropylcarbamoyloxy) - 2 - butynyltri-lower alkylammonium salts having ganglion stimulant activity and intermediates in the preparation thereof.

3,709,926

SUBSTITUTED PHENOXY-ALKANOIC ACIDS AND DERIVATIVES THEREOF

Fred Y. Edamura, Lennon H. McKendry, and Eric R. Larsen, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Feb. 1, 1971, Ser. No. 111,688
Int. Cl. C07c 69/76
U.S. Cl. 260—473 G 21 Claims

Compounds useful as herbicides, fungicides and insecticides described as substituted phenoxy- and phenylthioalkan(thio)oates and derivatives thereof.

3,709,927

METHOD FOR PREPARING METHACRYLIC ACID ESTER

Sango Kunichika and Yasumasa Sakakibara, Kyotofu, and Akio Noguchi, Konomu Kurisaki, Eizo Kato, and Mitsuru Uchiyama, Tokuyamashi, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

No Drawing. Filed Oct. 14, 1969, Ser. No. 866,376

Int. Cl. C07c *69/54, 69/56*

U.S. Cl. 260—486 AC 6 Claims

A methacrylic acid ester is prepared by allowing a mixture of methylacetylene and allene to react with carbon monoxide and an alcohol such as methanol or ethanol at a temperature ranging from 100° C. to 200° C. using a catalyst comprising nickel carbonyl and an organic acid such as methacrylic acid or crotonic acid under a total pressure between 10 and 60 atmospheres.

3,709,928

PROCESS FOR PURIFYING HYDROXYALKYL-ACRYLATES OR HYDROXYALKYLMETHAC-RYLATES BY DISTILLING IN THE PRESENCE OF POLYALKYLENEGLYCOLS

Masayuki Murayama, Niigata, and Koichi Abe, Niitsu, Japan, assignors to Japan Gas-Chemical Company, Inc., Tokyo, Japan

No Drawing. Filed June 5, 1970, Ser. No. 43,929

Claims priority, application Japan, June 5, 1969, 44/44,410

Int. Cl. C07c *69/52*

U.S. Cl. 260—486 B 3 Claims

A process for purifying hydroxyalkyl(meth)-acrylates by distillation, which comprises effecting said distillation in the presence of at least one member selected from the group consisting of polyalkyleneglycols, such as polyethyleneglycols, polypropyleneglycols, etc. and those containing at least four carbon atoms in which two hydroxy groups are arranged, interposing therebetween four or more carbon atoms, such as tetramethyleneglycol.

3,709,929

4-METHYL-2-PENTANOL CROTONATE

Fritz Exner and Theodor Leidig, Holzminden, Germany, assignors to Haarmann & Reimer Gesellschaft mit beschrankter Haftung, Holzminden, Germany

No Drawing. Filed Sept. 21, 1970, Ser. No. 74,228

Claims priority, application Germany, Apr. 10, 1970, P 20 17 208.1

Int. Cl. C07c *69/56*

U.S. Cl. 260—486 R 1 Claim

Subject of the invention is 4-methyl-2-pentanol crotonate, a process for its production whereby 4-methyl-2-pentanol is esterified with crotonic acid and the use of the crotonate for perfume compositions and as an odorant.

3,709,930

PETROLEUM COKE ACID SALTS

Robert M. Alm, Crown Point, Ind., assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Feb. 16, 1968, Ser. No. 705,911

Int. Cl. C07c *63/00*

U.S. Cl. 260—515 H 2 Claims

Process for the production of novel composition useful as soil beneficiation agent and product produced by such process, such process comprising oxidizing petroleum coke to form the coke acid, and neutralizing such acid with basic alkali metal compound and/or ammonium compound.

3,709,931

OXIDATION PROCESS EMPLOYING NITRIC ACID CATALYSIS FOR THE PREPARATION OF HUMATES FROM COAL

Wayne A. Proell, Seymour, Ind., and Clifford E. Selin and Stanford T. Holbrook, Salt Lake City, and Francis H. Hammond, Bountiful, Utah, assignors to American Hydrocarbon Company, Salt Lake City, Utah

Filed Oct. 9, 1968, Ser. No. 766,163

Int. Cl. C07c *63/00*

U.S. Cl. 260—515 H 9 Claims

An oxidation process employing nitric acid catalysis for the preparation of humates and other organic chemicals from coal. The process comprises the steps of introducing oxygen and a catalytic amount of nitric acid into a reactor containing a pulverized coal, to which 5% to 35% of moisture and 25% of the total amount of nitric acid to be employed has been admixed, maintaining the temperature of this reactor at between about 150° F. to about 225° F., terminating the reaction within at least ten hours and recovering humates and other organic chemicals.

3,709,932

PHOSPHONOUS DICHLORIDES

Eugene H. Uhing, Ridgewood, N.J., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Sept. 22, 1969, Ser. No. 860,058

Int. Cl. C07f *9/48*

U.S. Cl. 260—543 P 10 Claims

Organophosphonous dichlorides are produced by reacting phosphorus trichloride with a hydrocarbon, e.g., a lower alkane, lower alkene, benzene, or a substituted derivative thereof at a temperature in excess of 350° C. in the presence of phosgene. These phosphonous dichlorides are useful as toxicants and chemical intermediates in many syntheses.

3,709,933

NITRILOTRIACETYLTRICHLORIDE

George C. Hopkins, Clarence, and Raymond R. Hindersinn, Lewiston, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Dec. 30, 1968, Ser. No. 788,073

Int. Cl. C07c *99/00, 125/00, 125/04*

U.S. Cl. 260—544 Y 9 Claims

Nitrilotriacetyltrichloride, a process for preparing said compound by the reaction of nitrilotriacetic acid with phosphorus pentachloride and the utility of said compound as a chemical intermediate.

3,709,934

METHOD OF MAKING CARBOXYLIC ACID ANHYDRIDES

Wilhelm Gruber, Wolfgang Kleine-Doepke, and Peter Quis, Darmstadt, and Guenther Schroeder, Oberramstadt, Germany, assignors to Rohm & Haas G.m.b.H., Darmstadt, Germany

No Drawing. Filed Feb. 27, 1970, Ser. No. 15,266

Claims priority, application Germany, Mar. 1, 1969, P 19 10 463.3

Int. Cl. C07c *51/56*

U.S. Cl. 260—546 12 Claims

Method of making carboxylic acid anhydrides by reacting dicyan and a carboxylic acid.

3,709,935

SUBSTITUTED GLYOXAL DITHIOSEMICARBAZONES

Paul Anthony Barrett, 183–193 Euston Road, London, England

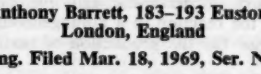
No Drawing. Filed Mar. 18, 1969, Ser. No. 826,038

Claims priority, application Great Britain, Mar. 26, 1968, 14,529/68

Int. Cl. C07c *159/00*

U.S. Cl. 260—552 SC 8 Claims

Novel semicarbazones useful in the treatment of anaplasmosis having the formula:



wherein R^1 is a methyl or ethyl group, R^2 is a hydrogen atom or a methyl group, and R^3 and R^4 are different, each being a hydrogen atom, a methyl, or an ethyl group.

3,709,936

PLANT GROWTH REGULATORS

Tomas L. Fridinger and Edward L. Mutsch, Woodbury Township, Washington County, and David R. Pauly, Stillwater, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,074

Int. Cl. C07c *133/02*

U.S. Cl. 260—554 5 Claims

The substitution of semicarbazones of 2',6'-dihalobenzaldehydes by 1-alkyl groups and 3-alkylsulfonyl or 3-arylsulfonyl groups, provides compounds which are active plant growth regulators. Plant growth regulation provides a more efficient means of growing food-producing plants and the like.

3,709,937

AMIDES OF HEXAHYDRO-4,7-METHANOINDAN-2-CARBOXYLIC ACID

Carl Peter Krimmel, Wauconda, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Original application July 17, 1967, Ser. No. 653,648, now Patent No. 3,547,976. Divided and this application July 23, 1970, Ser. No. 57,813

Int. Cl. C07c *103/86*

U.S. Cl. 260—557 B 3 Claims

Dialkylaminoalkyl amides of hexahydro-4,7-methanoindan-2-carboxylic acid are described herein. They possess anti-bacterial, anti-protozoal, anti-fungal, and anti-algal activity. The compounds are prepared from the indan-2-carboxylic acid chloride.

3,709,938

2,6-DIHALO-m-SUBSTITUTED-BENZOIC ACID AMIDES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Dec. 10, 1969, Ser. No. 884,011

Int. Cl. C07c *103/22*

U.S. Cl. 260—558 D 7 Claims

2,6-dihalo-m-substituted-benzoic acids and acid amides, e.g., 2,6-dichloro - m - methoxybenzoic acid or 2,6 - dichloro-m-methoxy benzamide, are prepared from substituted 2,4-dihalo benzene compounds and are useful as anti-coccidial agents, herbicides and central nervous system depressants.

3,709,939

3,5-DIHALO-4-AMIDO-ALKOXY PHENOLS

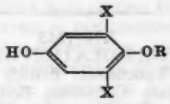
Linneaus C. Dorman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application July 8, 1966, Ser. No. 563,719, now Patent No. 3,468,926, dated Sept. 23, 1969. Divided and this application June 11, 1969, Ser. No. 839,133

Int. Cl. C07c *103/26*

U.S. Cl. 260—559 B 9 Claims

Compounds of the formula



wherein each X is F, Cl or Br and R is an alkyl group bearing as a substituent a carboxyl, cyano, carboxamide or carbalkoxy group, are made by reaction of the corresponding halohydroquinone with the appropriate alkylating agent in the presence of a base and in an aprotic solvent. The products are useful as bactericides and herbicides.

3,709,940

PHOSPHORUS COMPOUNDS FOR FLAMEPROOFING FABRICS

Wilhelm Flugel, Speyer, Germany, assignor to Dr. Quehl & Co. GmbH, Speyer, Germany

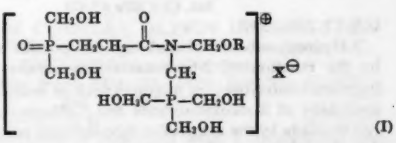
No Drawing. Filed Mar. 3, 1971, Ser. No. 120,740

Claims priority, application Germany, Mar. 5, 1970, P 20 10 531.1; Nov. 10, 1970, P 20 55 289.0

Int. Cl. C07c *103/30*

U.S. Cl. 260—561 P 7 Claims

Organic phosphorus compounds of the general formula



(I)

in which R is H or C_{1-3} alkyl and X is halogen or OH, are useful for flameproofing textiles, especially textiles including cellulosic fibres.

3,709,941

DINITRIMINES

John F. DeBardeleben, Jr., Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed June 1, 1970, Ser. No. 42,586

Int. Cl. C07c *119/00*

U.S. Cl. 260—566 R 8 Claims

Lower aliphatic dinitrimines are disclosed, including both open chain and cyclic dinitrimines. They are prepared by the reaction of a dioxime with dinitrogen tetroxide at low temperatures. The IR spectrum is compared with that of the known compound, camphor nitrimine and ultraviolet measurement indicate spectra typical of nitrimines. The compounds have uses in pharmocology, in tobacco, as blowing agents and as propellants.

3,709,942

PREPARATION OF DIMETHYLHYDROXYLAMINE

George J. Kaminsky, Cincinnati, and Robert G. Laughlin, Colerain Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 30, 1970, Ser. No. 76,843
Int. Cl. C07c *83/02*
U.S. Cl. 260—583 DD 7 Claims

An improved process for the preparation and recovery of dimethylhydroxylamine by pyrolyzing aqueous alkyldimethylamine oxide. The pyrolysis is effected by injecting the aqueous amine oxide onto a heated reaction surface under reduced pressure, mechanically dispersing the amine oxide solution into a thin film over the reaction surface for pyrolysis, distilling the dimethylhydroxylamine and olefin pyrolysis products and separating the dimethylhydroxylamine. Dimethylhydroxylamine is useful in synthesizing 3-hydroxyalkyl surfactants and can also be used as a polymerization inhibitor.

3,709,943

PROCESS FOR THE ISOLATION OF D-ISOTHUJONE

Vladimir Hach, Vancouver, British Columbia, Robert William Lockhart, Coquitlan, British Columbia, and Dennis Murray Cartlidge, New Westminster, British Columbia, Canada, assignors to MacMillan Bloedel Limited, Vancouver, British Columbia, Canada

Filed Aug. 17, 1970, Ser. No. 64,175
Int. Cl. C07c *49/26*
U.S. Cl. 260—587 14 Claims

An improved process is described for recovering d-isothujone from a mixture containing 1-thujone and d-isothujone which comprises contacting such mixture containing at least 35% by weight of d-isothujone with an aqueous bisulfite solution so as to form an adduct of d-isothujone and bisulfite and decomposing the adduct to obtain pure d-isothujone. The thujone mixture preferably contains at least 70% by weight of the two thujones and the ratio of the thujones can be adjusted by isomerization.

3,709,944

METHOD OF PREPARING 3-HYDROXY ALDEHYDES AND KETONES

Siegfried H. Schroeter, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 732,853, May 29, 1968, Pat. No. 3,522,317. This application April 1, 1970, Ser. No. 24,832
Int. Cl. C07c *45/00*
U.S. Cl. 260—598 4 Claims

3-Hydroxy-substituted carbonyl compounds are produced by the reaction of 2-hydrocarbonoxyoxetanes with water. Hydrocarbonoxyoxetane mixtures such as mixtures consisting essentially of 2-alkoxyoxetanes and 3-alkoxyoxetanes which can be made by the ultraviolet light-induced reaction of an aldehyde or ketone with a vinyl ether also can be employed as the 2-hydrocarbonoxyoxetane. The 3-hydroxy-substituted carbonyl compounds made by the aforesaid method can be employed as plasticizers for polyvinylchloride resins, cosolvents for aqueous polyvinyl alcohol, or maleic anhydride vinyl ether copolymer mixtures, etc. The 3-hydroxy-substituted carbonyl compounds also are intermediates for making α,β-unsaturated aldehydes and ketones which include useful intermediates for making vitamin A and polymers.

3,709,945

PRODUCTION OF THIODIGLYCOL

Walter Goetze, Ludwigshafen, Werner Kasper, Frankenthal, and Gerhard Klatt and Gerhard Schulz, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Mar. 16, 1970, Ser. No. 20,150
Int. Cl. C07c *149/18*
U.S. Cl. 260—609 R 3 Claims

An improved process for the production of thiodiglycol by reaction of ethylene oxide and hydrogen sulfide in a molar ratio of about 2:1 in the presence of thiodiglycol as solvent at elevated temperature and at superatmospheric pressure, wherein the improvement consists in carrying out the reaction in a homogeneous phase. Thiodiglycol is used for the production of textile and dyeing auxiliaries.

3,709,946

PREPARATION OF ACETYLENIC ALCOHOLS

Robert J. Tedeschi, Whitehouse Station, and George L. Moore, South Plainfield, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

No Drawing. Continuation of application Ser. No. 649,834, June 29, 1967. This application July 31, 1970, Ser. No. 64,128
Int. Cl. C07c *33/04, 33/06, 35/08*
U.S. Cl. 260—617 E 1 Claim

An acetylenic alcohol is prepared by reacting a ketone with liquefied acetylene in the presence of a co-catalyst system comprising liquid ammonia and an alkali metal hydroxide.

3,709,947

6 - CHLOROPROPYLIDENE - 1,1a,6,10b - TETRAHYDROBENZO[a,e]CYCLOPROPA[c]CYCLOHEPTENES

John W. Cusic, Skokie, Ill., and William E. Coyne, St. Paul, Minn., assignors to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed July 26, 1971, Ser. No. 164,862
Int. Cl. C07c *25/18*
U.S. Cl. 260—649 R 3 Claims

1,1a,6,10b - tetrahydrodibenzo[a,e]cyclopropa[c]cycloheptenes having a chloropropylidene substituent at the 6-position are described herein. They are prepared by starting from the appropriate 1,1a,6,10b - tetrahydrodibenzo[a,e]cyclopropa[c]cyclohepten-6-one. They are useful as intermediates in the preparation of aminopropylidene compounds which are themselves useful as antidepressants, and as anti-bacterial, anti-protozoal, and anti-algal agents.

3,709,948

REARRANGEMENT OF BROMOFLUORINATED PROPENE

Robert Neville Haszeldine, Disley, Ronald Eric Banks, Torkington, and David Robin Taylor, Bramhall, England (all % Pennwalt Corporation, 900 1st Ave., King of Prussia, Pa. 19406)

No Drawing. Filed June 26, 1969, Ser. No. 836,948
Claims priority, application Great Britain, July 12, 1968, 33,407/68
Int. Cl. C07c *21/18*
U.S. Cl. 260—653.3 1 Claim

The new compound perfluoro(methylacetylene) is prepared by a series of reactions involving the new intermediate compounds 3-bromo-1,1,3,3-tetrafluoropropene; 1,2,3-tribromo-1,1,3,3-tetrafluoropropane; 2,3-dibromo - 1,1,3,3-tetrafluoropropene; and 1,2 - dibromo-1,3,3,3-tetrafluoropropene.

3,709,949

ISOMERIZATION OF 1,2-DICHLORO-3-BUTENE TO 1,4-DICHLORO-2-BUTENE

Ronnie D. Gordon and Charles M. Starks, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

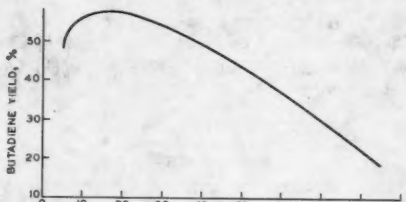
No Drawing. Filed June 7, 1971, Ser. No. 150,721
Int. Cl. C07c *21/04*
U.S. Cl. 260—654 R 6 Claims

1,2-dichloro-3-butene is isomerized to 1,4-dichloro-2-butene in the presence of a carbon catalyst.

3,709,950
MANUFACTURE OF HALOHYDROCARBONS
Ralph W. Baker, Greenwell Springs, and John H. McCarthy, Harold G. Place, and Andrew O. Wikman, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.
No Drawing. Continuation-in-part of applications Ser. No. 583,113, Sept. 29, 1966, now Patent No. 3,468,968, and Ser. No. 784,256, Dec. 16, 1968, now abandoned, the latter being a continuation-in-part of said application Ser. No. 583,113, which is a continuation-in-part of abandoned applications Ser. No. 127,794, Ser. No. 127,801, and Ser. No. 127,802, all July 31, 1961. This application July 28, 1969, Ser. No. 845,579
The portion of the term of the patent subsequent to Sept. 23, 1986, has been disclaimed
Int. Cl. B01j *11/78*; C07c *17/08*
U.S. Cl. 260—659 A 3 Claims

A microspherical alumina catalyst carrier for use in an oxyhalogenation process.

3,709,951
METHOD OF CONTROLLING AN OXIDATIVE DEHYDROGENATION
Thomas Hutson, Jr., Bartlesville, Okla., and Ronald E. Ritter, Columbia, Md., assignors to Phillips Petroleum Company
Continuation of abandoned application Ser. No. 733,177, May 29, 1968. This application May 17, 1971, Ser. No. 144,287
Int. Cl. C07c *5/18*
U.S. Cl. 260—680 E 10 Claims



A method of optimizing production of reaction products from a reaction zone in which occur primary and secondary reactions by measuring the content of one of the secondary reaction reactants in the effluent from the reaction zone and controlling a primary variable of the reaction zone in accordance therewith.

3,709,952
DIMERIZATION OF OLEFINES
Guy Desgrandchamps, Billere, and Henri Hemmer and Michel Haurie, Pau, France, assignors to Société Anonyme dite: Société Nationale des Petroles d'Aquitaine, Courbevoie, France
No Drawing. Filed Dec. 23, 1969, Ser. No. 887,738
Claims priority, application France, Dec. 27, 1968, 181,328
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 D 13 Claims

Process for the dimerization and codimerization of olefines, which consists in maintaining the olefine or olefines in an inert solvent in contact with a catalyst system comprising a nickel-based complex formed of a cation, in which the nickel is combined with 6 molecules of an organic sulphoxide, and of an anion formed by a complex halide of a metal of Group VIII of the Periodic Table, the complex being accompanied by an organoaluminium compound.

The process can be carried out in accordance with two variants: either preparation of the catalyst in situ, this requiring an Al/transition metal ratio which is between 3 and 9, or preparation of the catalyst ex-situ (continuous process), this requiring an Al/transition metal ratio higher than 9.

3,709,953
PROCESS FOR DIMERIZATION, CODIMERIZATION, POLYMERIZATION AND COPOLYMERIZATION OF MONO-OLEFINES
Normann Bergem, Oslo, Ulf Blindheim, Skedsmokorset, Olav-Torgeir Onsager, Baerum, and Hagbarth Wang, Oslo, Norway, assignors to Sentralinstitutt for Industriell forskning, Oslo, Norway
No Drawing. Continuation of application Ser. No. 630,843, Apr. 14, 1967. This application Jan. 9, 1970, Ser. No. 1,892
Claims priority, application Norway, Apr. 15, 1966, 162,601
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 D 3 Claims

The invention relates to a process for the preparation of mono-olefines having a high content of β-olefines in the range C_4–C_{50} by dimerization, codimerization, polymerization and copolymerization of mono-olefines from the range C_2–C_{15}. The conversion is performed in the presence of a catalytic mixture of a compound of a metal from the 8th sub-group of the periodic table, a Lewis acid and, if desired, a Lewis base and/or electron donor-acceptor compounds thereof.

3,709,954
PREPARATION OF LIQUID POLYMERS OF OLEFINS
Frederick J. Karol, Somerset, and George L. Karapinka, Piscataway, N.J., assignors to Union Carbide Corporation, New York, N.Y.
No Drawing. Filed Mar. 16, 1970, Ser. No. 20,156
Int. Cl. C08c *3/10*
U.S. Cl. 260—683.15 D 3 Claims

Liquid polymers of olefins, and in particular liquid polymers of ethylene, are prepared by polymerizing olefin monomer by contacting the olefin charge with a supported bis-(cyclopentadienyl)chromium[II] catalyst in an inert organic solvent, in the absence of chain transfer agents, at a temperature of $\geq 140°$ C. and at a pressure of about 0 to 1000 p.s.i.g.

3,709,955
PALLADIUM COMPLEX OLEFIN DIMERIZATION
Howard E. Dunn, Mount Vernon, Ind., assignor to Phillips Petroleum Company
No Drawing. Filed Mar. 23, 1970, Ser. No. 22,097
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 D 4 Claims

An acyclic olefin is dimerized with a catalyst formed from an organoaluminum compound and a palladium complex such as bis(benzonitrile) dichloropalladium, bis(π - cyclohexenyl)dichlorodipalladium, di-μ-chlorobis (N,N-dimethylbenzylamine - 2,C,N)dipalladium and bis (picolinato)palladium.

3,709,956
POLYESTER-SILOXANE PAINT
John D. Nordstrom, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.
No Drawing. Original application Nov. 18, 1968, Ser. No. 776,780, now Patent No. 3,577,262. Divided and this application Dec. 17, 1970, Ser. No. 99,247
Int. Cl. C08f *21/00*
U.S. Cl. 260—827 15 Claims

A radiation-curable paint is provided by mixing an alpha-beta olefinically unsaturated polyester resin and an alpha-beta olefinically unsaturated siloxane. The resin may be any alpha-beta olefinically unsaturated polyester

having between about 0.5 and about 5 units of alpha-beta olefinic unsaturation per 1,000 units molecular weight. Both maleic type and acrylic type unsaturation are illustrated. In one embodiment, the polyester is the common, conventional polyester formed from maleic anhydride, a glycol, and ring type anhydride, e.g., phthalic anhydride, a glycol, and an aromatic or saturated anhydride, e.g., phthalic anhydride, tetrahydrophthalic anhydride, etc. In another embodiment, a saturated polyester is reacted with a diisocyanate and the product reacted with a hydroxyalkyl acrylate. In another embodiment, the polyester is a siloxane-modified polyester.

The unsaturated siloxane component is the reaction product of at least two molar parts of a monomeric, monohydroxy ester of an alpha-beta olefinically unsaturated monocarboxylic acid, e.g., acrylates, methacrylates, crotonates, cinnamates, with one molar part of a siloxane having at least two silicon atoms with one valence satisfied by a hydroxyl group or an alkoxy group. The reaction is a conventional condensation reaction. Vinyl monomers may also be included in the paint dispersion.

3,709,957

POLYETHYLENE BLENDS OF ETHYLENE-METHACRYLIC ACID COPOLYMER AND POLYETHYLENE

Donald Lee Brebner, Orange, Tex., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 2, 1964, Ser. No. 393,928

Int. Cl. C08f *15/04, 15/14*

U.S. Cl. 260—897 B **4 Claims**

Polymeric blends consisting of ethylene-methacrylic acid copolymers and polyethylene.

3,709,958

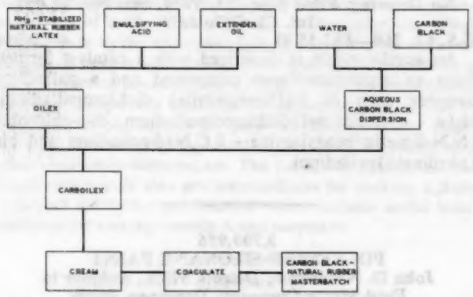
NATURAL RUBBER MASTERBATCHES

John E. Burleigh, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 8, 1971, Ser. No. 104,984

Int. Cl. C08c *11/22*

U.S. Cl. 260—754 **8 Claims**



Natural rubber-extender oil-carbon black masterbatches are prepared by addition of a mixture of a fatty acid and extender oil to an ammonia-stabilized natural rubber latex and adding a carbon black dispersion to the resulting oilex. The carboilex which results from the admixture is then creamed and coagulated by conventional procedures.

3,709,959

OXIMINOPHOSPHONODITHIOATES

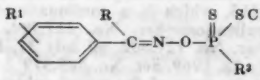
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Filed April 6, 1970, Ser. No. 26,151

Int. Cl. C07f *9/06;* **A01n** *9/36*

U.S. Cl. 260—940 **5 Claims**

Compounds having the formula



in which R is alkyl; R^1 is hydrogen; nitro, or halogen, R^2 is alkyl; and R^3 is (1) hydrogen, (2) lower alkylthio, (3) cyano, (4) alkyl, and (5) ethynyl and their use as insecticides and acaricides.

3,709,960

O-LOWERALKYL-O - [2 - ALKOXYLCARBONYL-METHYL]VINYL-MONOALKYLAMIDO PHOSPHATES

Karl Lutz, Basel, and Max Schuler, Basel-land, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

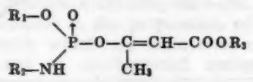
No Drawing. Continuation-in-part of application Ser. No. 706,654, Feb. 19, 1968. This application Nov. 12, 1969, Ser. No. 876,105

Claims priority, application Switzerland, Feb. 22, 1967, 2,599/67

Int. Cl. C07f *9/24;* **A01n** *9/36*

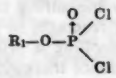
U.S. Cl. 260—941 **11 Claims**

Novel insecticidally active phosphoric acid amide esters of the Formula I



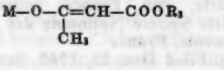
I

in which each of R_1, R_2 and R_3 represents an alkyl radical with from 1 to 5 carbon atoms inclusive, are produced by reacting a compound of the Formula IV



IV

with an alkylamine in the presence of an acid acceptor, and then reacting the resulting reaction product with the enol form of an acetic acid alkyl ester of the Formula III



III

in which M is a salt forming atom or radical. Preparations containing varying amounts of the compounds of Formula I and one or more diluents (e.g. isooctylphenyl-octaglycol ether and/or a high boiling petroleum fraction and/or xylene, diisohexyl/heptylphenylhexaglycol ether and acetone, and laurylhexaglycol ether and so-propyl alcohol) are used to show the pesticidal effect of the said active agents by means of contact tests on *Bruchidius obtectus* and Ephestia (Anagesta) Kuehniella, feed effect on *Carausius morosus* and acaricidal contact effect on *Tetranychus telarius*. Some comparative tests are also given to demonstrate superiority over known compounds having pesticidal activity, including lesser toxicity towards warm-blooded animals.

3,709,961

N-ISOPROPYL-O-ETHYL-O-ARYLPHOSPHORIC ACID ESTER AMIDES

Gerhard Schrader, Wuppertal-Cronenberg, and Bernhard Homeyer, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed June 17, 1970, Ser. No. 47,137
Claims priority, application Germany, July 4, 1969, P 19 34 001.3
Int. Cl. C07f 9/12; A01n 9/36
U.S. Cl. 260—949 3 Claims

N-isopropyl - O - ethyl - O - arylphosphoric acid ester amides, i.e. N-isopropyl - O - ethyl-O-(3-methyl-4-methyl sulfonyl- and sulfoxyl-phenyl) - phosphoric acid ester amides which possess nematocidal, arthropodicidal, especially acaricidal and insecticidal, properties and which may be produced by conventional methods.

3,709,962

β-PHENYLETHYL ESTERS OF O-ALKYL-O-PHENYLTHIONOTHIOLPHOSPHORIC ACIDS

Gerhard Schrader, Wuppertal-Cronenberg, and Ingeborg Hammann, Cologne, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 30, 1970, Ser. No. 24,019
Claims priority, application Germany, Apr. 3, 1969, P 19 17 164.3
Int. Cl. C07f 9/12; A01n 9/36
U.S. Cl. 260—949 5 Claims

β-Phenylethyl esters of O-alkyl-O-phenylthionothiolphosphoric acids which possess insecticidal and acaricidal properties and process for their production.

3,709,963

PROCESS FOR PRODUCING DENSE PARTICLES OF PLUTONIUM COMPOUNDS USABLE AS FUELS FOR NUCLEAR REACTORS

Guido Cogliati, Agostino Recrosio, and Renato Lanz, Rome, Italy, assignors to Comitato Nazionale per l'Energia Nucleare, Rome, Italy

No Drawing. Filed Oct. 4, 1968, Ser. No. 765,024
Claims priority, application Italy, Oct. 13, 1967, 40,045/67
Int. Cl. G21c 21/00
U.S. Cl. 264—.5 12 Claims

Dense particles of a compound of plutonium or a mixed compound of plutonium and another metal of the lanthanide or actinide series are produced by a process wherein an acid solution of plutonium (IV) is transformed into a colloidal acid-deficient solution through extraction of nitric acid by means of a liquid anion exchanger until a nitrate-to-plutonium ratio in the range of from 1 to 1.5 is produced and through evaporation of water, if necessary, until a concentration of plutonium in the range of 1 to 2 moles per liter is produced. The colloidal solution of plutonium (IV) may be mixed, if desired, with a suitable colloidal solution of another metal of the actinide or lanthanide series and/or carbon powder. The resulting colloidal solution is dispersed as drops which are transformed into gel particles calcined at suitable temperatures.

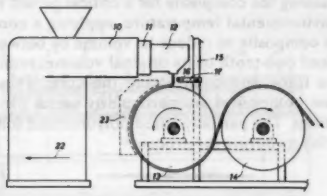
3,709,964

PROCESS FOR PRODUCING POLYMERIC FILM

Wilfried Florent De Geest, Berchem, Paul August Verkinderen, Edegem, and Felix Frederik De Smedt, Wilrijk, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

Filed Oct. 29, 1970, Ser. No. 85,037
Claims priority, application Great Britain, Oct. 30, 1969, 53,306/69
Int. Cl. B29d 7/02
U.S. Cl. 264—22 5 Claims

The operation of an extrusion arrangement wherein a discharge electrode deposits electric charges on an extruded molten film which is received on a quenching surface, is facilitated when the discharge electrode is



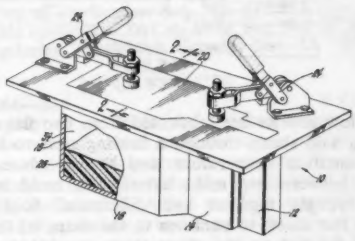
located at the side of the film which will be received on the quenching surface.

3,709,965

FORMING SKIN COVERED FOAM BY EXPANDING A POLYURETHANE MIXTURE CONTAINING EXCESS BLOWING AGENT IN A CLOSED MOLD

Gregory A. Campbell, Romeo, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 4, 1971, Ser. No. 121,046
Int. Cl. B27d 27/04
U.S. Cl. 264—45 3 Claims



The core density and skin thickness of a molded integral skin foam polyurethane article are varied independently by employing a measured excess of fluorocarbon blowing agent in the catalyzed polyisocyanate-polyol mixture over the maximum amount of blowing agent required to produce a stable, free-rise foam. The exothermic heat of reaction vaporizes the liquid blowing agent to generate substantial pressure, depending upon the amount of blowing agent, within a closed mold. The pressure exceeds the vapor pressure of the blowing agent at the relatively cool mold surfaces, causing the foam in this region to collapse and form a skin up to one to three millimeters in thickness. The core density of the article, on the other hand, is dependent substantially only upon the quantity of polymerizable mixture charged to the mold. The polymerizable mixture is not capable of forming a stable, free-rise foam because of the blowing agent content.

3,709,966

COMPRESSION OF LAYERS OF POLYURETHANE FOAM CONTAINING AT LEAST ALTERNATE LAYERS OF PARTIALLY CURED FOAM

Mario A. Gambardella, Milford, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 732,848, May 29, 1968, abandoned. This application Aug. 19, 1970, Ser. No. 65,326
Int. Cl. B29d 27/00
U.S. Cl. 264—46 12 Claims

Polyurethane foam composites characterized by at least one layer of flexible, densified polyurethane foam are prepared by

placing a plurality of layers of polyurethane foam, including at least alternate layers of partially cured polyurethane foam, in contiguous relationship, thereby forming a composite structure, maintaining the composite for a critical period of time at a critical environmental temperature, applying a compressive force to the composite to reduce its volume by between about two-thirds and one-tenth of its original volume, removing the compressive force and completeing the cure. These polyurethane foam composites are particularly useful for cushioning applications. The partially cured polyurethane foam bonds to adjacent layers during the process.

3,709,967

THERMOFORMING ORIENTED HOLLOW ARTICLES FROM TWO SHEETS

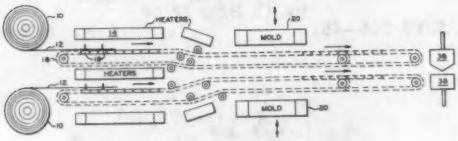
Edward C. Held, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Nov. 18, 1970, Ser. No. 90,576

The portion of the term of the patent subsequent to Dec. 15, 1987, has been disclaimed

Int. Cl. B29c *17/04, 27/00*

U.S. Cl. 264—89 **10 Claims**



Hollow articles are fabricated from two flat sheets by passing said sheets through a heating zone to heat same to orientation temperature, and thence advancing said sheets between two mold halves. The mold halves are then brought together and differential fluid pressure causes the sheets to conform to the shape of the respective mold halves, the sheets being sealed around the peripheral edges of the mold.

3,709,968

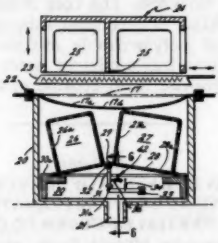
METHOD OF FORMING ARTICLES COMPRISING A PAIR OF ADJACENT WALLED STRUCTURE HAVING UNIDIRECTIONALLY PRESENTED OPENINGS

Norman F. Houghton, Connersville, Ind., assignor to Philco Ford Corporation, Philadelphia, Pa.

Filed Sept. 21, 1970, Ser. No. 73,761

Int. Cl. B29c *17/04*

U.S. Cl. 264—92 **5 Claims**



In a vacuum-forming operation, a pair of adjacent, side-by-side compartment liners are formed from a single sheet of thermoplastic material. A pair of adjacent molds, each having the desired shape of the inside surface of the corresponding liner to be formed, are mounted along their base portions on frame structure hinged in the region of adjacency of the mold base portions, to provide for pivotation of the base portions so that confronting surfaces of the molds are movable angularly toward and away from one another. A sheet of thermoplastic material is disposed to extend over the molds, and is heated, causing it to soften while the molds are held in pivoted position in which the confronting surfaces are substantially spaced from one another. Mold assist-plugs and the molds are then moved, relative to one another, to urge the sheet into general close conformity with the molds. While the sheet of material is still soft the assist-plugs further are caused to engage the mold frame structure, through the intermediacy of the sheet, pivoting the frame structure and causing adjacent wall portions of the molds to move toward one another and assume their closely spaced position. Air entrapped between the heated sheet and the walls of the molds is then evacuated through a number of small ports or vents in the walls, thereby forming the desired liners which are cooled and stripped from the molds.

3,709,969

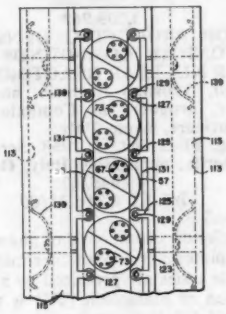
METHOD FOR CONTINUOUSLY EXTRUDING NET-LIKE STRUCTURES COMPOSED OF TWISTED MULTIFILAMENT YARNS

Theodore H. Fairbanks, Liverpool, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of application Ser. No. 825,213, May 16, 1969, now Patent No. 3,613,161. This application Jan. 5, 1971, Ser. No. 104,033

Int. Cl. D01d *3/00;* D02g *1/20*

U.S. Cl. 264—103 **5 Claims**



Method of making net-like structures in which paired groups of extruded filaments are periodically shifted to provide different pairs, while the filaments in each such group are twisted into a yarn. Alternately with such shifting, the paired groups of filaments are rotated a multiple of 180° about an axis between the group of each such pair.

3,709,970

APPARATUS AND METHOD FOR QUENCHING AND STABILIZING EXTRUDED MOLTEN FILAMENTS

Herman W. Hemker, West Chester, Pa., assignor to FMC Corporation, Philadelphia, Pa.

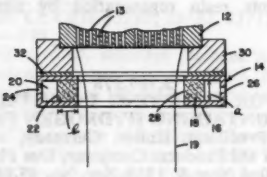
Filed July 1, 1969, Ser. No. 838,271

Int. Cl. B28b *3/20;* B29c *25/00*

U.S. Cl. 264—176 F **4 Claims**

A method and apparatus for increasing the production capability of an existing spinneret in the preparation of fibers from molten filaments with reduced cementation

of said molten filaments wherein an annular porous member is positioned below the spinneret to impinge a uniform and specific rate of diffused cooling gas onto the filaments, is disclosed herein.

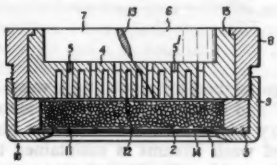


3,709,971

METHOD AND APPARATUS FOR PRODUCING MULTI-LAMINATED FIBERS

Keitaro Shimoda; Nobuhiro Tsutsui; Keiichi Zoda, and Masayuki Ueki, both of 1900 Kanaoka Saidaiji, all of Okayama, Japan, assignors to Japan Exlan Company Limited

Filed May 13, 1970, Ser. No. 36,805
Claims priority, application Japan, May 14, 1969, 44/37494
Int. Cl. B29b *1/04;* B29f *3/10*
U.S. Cl. 264—182 8 Claims



This invention relates to a process and apparatus for producing new multi-laminated fibers in which at least two different kinds of fiber-forming components are mutually dispersed in the cross-section of the fiber.

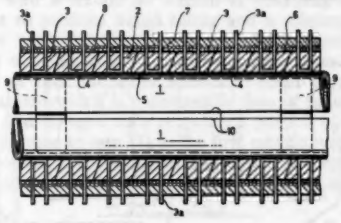
3,709,972

METHOD FOR MANUFACTURING A PERFORATED TUBE

Willem Gerholt, Hardenberg, Netherlands, assignor to Industriele Onderneming Wavin N.V., Zwolle, Netherlands

Continuation-in-part of application Ser. No. 756,047, Aug. 28, 1968. This application June 5, 1970, Ser. No. 43,807
Claims priority, application Netherlands, Sept. 1, 1967, 6712016
Int. Cl. B29c *25/00*
U.S. Cl. 264—236 6 Claims

A perforated filter tube manufactured by wrapping tape shaped thermoplastic or textile material on a deformable core, outwardly protruding metal projections being anchored in the material, and reinforcing glass fibers and a polyester or epoxy resin being applied on the layer formed by the windings on the core, without covering the end of the projections with resin or fibers. After polymerization at a temperature of, for example 70° C., the deformable core is removed and the tape-shaped material together with the projections is removed by pulling the same from the inner side of the thusly formed tube.



3,709,973

MANUFACTURE OF FOOTWEAR AND/OR COMPONENTS THEREOF BY INJECTION MOLDING OF SYNTHETIC RESINOUS MATERIAL OR OTHER MOLDING MATERIALS

Frank V. Maltby, Don Mills, Ontario, Canada, assignor to Bata Shoe Company, Inc., Belcamp, Md.

Continuation of application Ser. No. 691,851, Dec. 19, 1967. This application Oct. 2, 1970, Ser. No. 77,690
Claims priority, application Canada, Dec. 23, 1966, 978,858
Int. Cl. B29f *1/10*
U.S. Cl. 264—244 6 Claims

The shaping of an insole and the production of an article of footwear in which an insole blank is positioned on a last member and pressed thereagainst by a first closure member for conforming the insole blank to the shape of the last member. A first molding material is injected into a first molding cavity provided between the insole and the first closure member and an upper is lasted onto the insole carrying last. A second molding material is injected into a second molding cavity provided by a second closure member positioned adjacent the last member.

ERRATUM

For Class 423—566 see:
Patent No. 3,709,660

3,709,974

VANADIUM RECOVERY PROCESS

John F. Nutter, Golden, and Frank C. Haas and David L. Thompson, Arvada, Colo., assignors to The Oil Shale Corporation, New York, N.Y.

No Drawing. Filed July 19, 1971, Ser. No. 164,023
Int. Cl. C22b *59/00*
U.S. Cl. 423—63 7 Claims

A hydrometallurgical process is provided for recovering vanadium values from a vanadium-bearing calcium-rich ore. The process involves treating an aqueous slurry of the ore with lime under elevated pressure and temperature conditions. The vanadium values are thereafter solubilized and recovered.

3,709,975

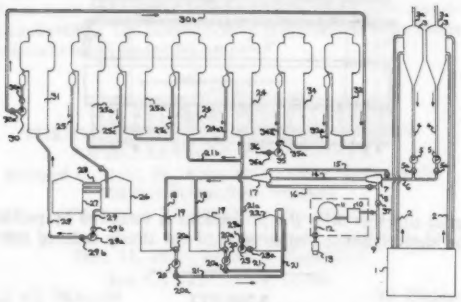
METHOD FOR THE OXIDATION OF BLACK LIQUOR

Carl D. Amsden, Orange, Tex., and Sergio F. Galeano, Toledo, Ohio, assignors to Owens-Illinois, Inc.

Filed May 28, 1970, Ser. No. 41,253
Int. Cl. C01d *5/00;* C01b *17/64*
U.S. Cl. 423—206 10 Claims

A continuous process for the molecular oxygenation of black liquor by the uninterrupted steps of oxidizing the

black liquor in a first oxygenation reactor, next, continuously oxidizing the liquor in a tubular conduit acting as a reactor connecting the first reactor to a second oxygenation reactor, and continuously oxidizing the liquor in

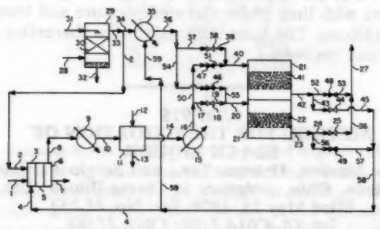


the second reactor, then transferring the liquor to a storage area wherein the liquor is maintained under oxidizing conditions while it is simultaneously oxidized in the storage tanks to produce an oxidized black liquor.

3,709,976
GAS DESULFURIZATION PROCESS
Mehmet Orhan Tarhan, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.
Filed Sept. 21, 1970, Ser. No. 74,077
Int. Cl. C01b *17/04*
U.S. Cl. 423—224 **4 Claims**

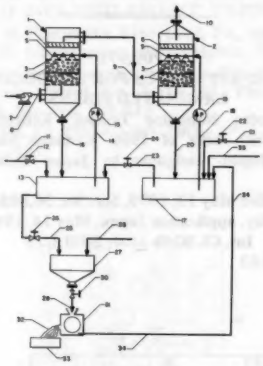
A self-contained process for removing acid gases, such as hydrogen sulfide, from industrial gases by absorption-desorption, which absorption-desorption includes subjecting the industrial gases to a vacuum induced by a steam-jet process and thereafter reacting the desorbed gases in a Claus process to produce elemental sulfur. The acid gas-contaminated steam condensate obtained as a by-product from the steam-jet vacuum process is decontaminated in a separate condensate stripper, and the acid gases removed from the condensate are reintroduced into the main desorbed acid gas stream. The heat produced from the Claus process is utilized, by heat exchange, to provide heat for the desorbing of the acid gases and the stripping of the acid gas-contaminated condensate.

3,709,977
REMOVAL OF SO_2 FROM GAS STREAMS
John F. Villiers-Fisher, Kendall Park, N.J., assignor to Chemical Construction Corporation, New York, N.Y.
Filed Nov. 16, 1970, Ser. No. 89,868
Int. Cl. C01b *17/60, 17/56*
U.S. Cl. 423—244 **6 Claims**



Sulfur dioxide is removed from a gas stream which also contains sulfur trioxide, by contacting the gas stream with a solid basic ion exchange resin. The gas stream is initially contacted with an alkali prior to contact with the resin, to remove sulfur trioxide and prevent sulfur trioxide adsorption by the resin, which would deplete resin activity and result in a tightly bound chemical union which prevents resin regeneration by simple thermal means.

3,709,978
PROCESS FOR PURIFYING INDUSTRIAL WASTE GASES CONTAINING HYDROGEN FLUORIDE
Hans H. Predikant, Hailer, Germany, assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Nov. 9, 1970, Ser. No. 87,688
Claims priority, application Germany, Dec. 24, 1969, P 19 64 746.2
Int. Cl. B01d *53/14*; C01b *7/22*; C01d *3/02*
U.S. Cl. 423—240 **6 Claims**



A multi-stage method for scrubbing a waste gas stream containing HF and SO_2 such as from the aluminum production industry where aluminum dust can also be present. Control of wash streams is maintained to preclude too much HF reaching the second stage washing zone cause sodium fluoride to precipitate and then block valves and piping. A combined effluent from each wash stage is passed to a neutralization zone where an alkaline stream such as caustic soda will cause precipitation of sodium fluoride and sodium sulphate along with entrained dust or aluminum particulates.

3,709,979
CRYSTALLINE ZEOLITE ZSM–11
Pochen Chu, Woodbury, N.J., assignor to Mobil Oil Corporation
No Drawing. Filed Apr. 23, 1970, Ser. No. 31,421
Int. Cl. C01b *33/28*
U.S. Cl. 423—328 **3 Claims**

A crystalline zeolite, designated ZSM–11, having the composition as follows:

$$0.9\pm0.3M_2O:W_2O_3:20 \text{ to } 90\ YO_2:zH_2O$$

wherein M is a cation, n is the valence of said cation, W is aluminum or gallium, Y is silicon or germanium and z is from 6 to 12, said zeolite characterized by specified X-ray diffraction values. Said zeolite is prepared by digesting a reaction mixture comprising $(R_4X)_2O$, sodium oxide, an oxide of aluminum or gallium, an oxide of silicon or germanium, and water, R_4X being a cation of a quaternary compound. Organic compound conversion is carried out in the presence of catalytically-active forms of said zeolite.

3,709,980

PRECIPITATION OF SILICEOUS PIGMENT

Raymond S. Chisholm, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation of abandoned application Ser. No. 852,102, Aug. 21, 1969. This application May 17, 1971, Ser. No. 144,250

Int. Cl. C01b *33/18, 33/32, 33/12*

U.S. Cl. 423—339 8 Claims

Small, finely divided, siliceous pigment is precipitated under circumstances to minimize or reduce the amount of water which is present in the filter cake when the precipitated silicate is filtered from the aqueous solution in which it is formed. The process is conducted by added acid to sodium silicate or like alkali metal silicate under conditions such as to produce a finely divided, recoverable silica pigment having an average ultimate particle size below about 500 angstroms, and controlling the temperature of the solution during acidification so that a portion of the acid is added at one temperature and another portion of the acid is added at a higher temperature, such higher temperature being established before all, and preferably before a major portion, of the silica has been precipitated from the solution. As a consequence of this process, the silica filter cake obtained has a higher concentration of solids and therefore a lower concentration of water.

3,709,981

REFRACTORY COMPOUNDS

Stephen Arthur Lee, Dunstable, Charles Frederick Cardy, Luton, and Keith George Sampson, Clophill, England, assignors to Laporte Industries Limited, London, England

Filed Aug. 20, 1970, Ser. No. 65,403

Int. Cl. C01b *31/36;* B01j *17/32*

U.S. Cl. 423—346 7 Claims

This invention relates to refractory compounds and specifically to a process of preparing silicon carbide. The process comprises reacting, in a reaction zone, at an elevated temperature silica, elementary carbon, a source of sulphur, hydrogen and a gaseous source of carbon, whereby silicon carbide is formed in a condensation zone. The source of carbon may be a hydrocarbon or carbon monoxide or a carbon/sulphur compound.

3,709,982

SYNTHESIS OF OXYCHLORINE TRIFLUORIDE

Charles B. Lindahl, Woodland Hills, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

No Drawing. Filed June 22, 1967, Ser. No. 649,423

Int. Cl. C01b *11/02, 11/24*

U.S. Cl. 423—466 4 Claims

Synthesis of oxychlorine trifluoride by the reaction of elemental fluorine with an alkali metal chlorite or an alkaline earth chlorite.

3,709,983

CONTINUOUS PROCESS FOR SCRUBBING H_2S FROM A GAS STREAM AND SELECTIVELY PRODUCING ELEMENTAL SULFUR

Robert J. J. Hamblin, Deerfield, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 802,356, Feb. 26, 1969, now Patent No. 3,594,125. This application July 19, 1971, Ser. No. 163,857

Int. Cl. C01b *17/04*

U.S. Cl. 423—573 17 Claims

H_2S is removed from a gas stream and sulfur is produced by the steps of: (1) sequentially scrubbing the gas stream with a first recycle water stream containing NH_4OH and then with a second recycle water stream which is substantially free of any NH_4OH to produce a treated gas stream which is reduced H_2S content and is substantially free of NH_3 and a rich absorbent stream containing NH_4HS; (2) catalytically reacting the rich absorbent stream with a first air stream to produce an effluent stream containing ammonium polysulfide; (3) catalytically reacting the resulting ammonium polysulfide-containing liquid stream with a second air stream at oxidizing conditions effective to produce liquid sulfur and a substantially sulfide-free water stream containing NH_4OH and a minor amount of $(NH_4)_2S_2O_3$ (4) stripping NH_3 from at least a portion of this last water stream in order to produce a water stream which is substantially free of ammonia and sulfide; and (5) separately recycling a portion of the water stream formed in step (3) as the first recycle water stream and a portion of the water stream formed in step (4) as the second recycle water stream to the scrubbing step.

3,709,984

PHOTOREACTIVE TITANIUM DIOXIDE MATERIAL

Horace F. Dantro, Toms River, N.J., assignor to NL Industries, Inc., New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 559,403, June 22, 1966. This application June 26, 1967, Ser. No. 648,955

Int. Cl. C01g *23/04*

U.S. Cl. 423—610 1 Claim

This invention relates in general to the preparation of titanium dioxide material which possesses photosensitive properties. More specifically it relates to a particular type of photosensitive titanium dioxide material which possesses sufficient photoreactive properties to be commercially useful in systems designed to respond to exposure to light i.e., photographic emulsions, copy paper and the like.

3,709,985

METHOD FOR DETERMINING TOTAL BLOOD SERUM IRON-BINDING CAPACITY

Charles R. Burke, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

No Drawing. Filed July 17, 1969, Ser. No. 842,725

Int. Cl. A61k *27/02, 27/04*

U.S. Cl. 424—1 2 Claims

A method for determining the total iron-binding capacity of blood serum. The method comprises first releasing the iron normally present on the serum and known as the serum iron (SI). The free iron is then removed to prevent it from recombining with the serum. Next, the serum is saturated with a tracer amount of radioactive iron, an ion-exchange resin is mixed with the serum-radioactive iron mixture and the combined mixture is incubated. After incubation, the initial radioactivity of the mixture and ion-exchange resin is measured with suitable detecting means, after which all of the liquid is removed. The ion-exchange resin is then washed and the residual radioactivity determined. By suitable calculation, the total iron-binding capacity of the serum is then determined.

3,709,986

METHOD OF PRODUCING AN EPIDURAL NERVE BLOCK

Masahiko Mima, Kyoto-shi, Japan, assignor to Otsuka Pharmaceutical Company Limited, Tokyo-to, Japan

No Drawing. Continuation-in-part of application Ser. No. 814,169, Apr. 7, 1969. This application Aug. 27, 1969, Ser. No. 853,490

Int. Cl. A61k *27/00*

U.S. Cl. 424—128 1 Claim

An analgesic method of reducing pain by an epidural nerve block which comprises injecting into the epidural space in the body of a patient a composition containing water, a sugar or sugar derivative and a potassium salt, and shortly thereafter injecting in the same area, an aqueous solution of a sugar or sugar derivative and calcium gluconate.

3,709,987

MEDICATED FEED SUPPLEMENT FOR TREATING CATTLE

Paul M. Williams, Spring Brook Farm, Rte. 2, Troy, Ohio 45373

No Drawing. Continuation-in-part of application Ser. No. 572,886, Aug. 17, 1967. This application Oct. 6, 1969, Ser. No. 864,180

Int. Cl. A61k 27/00

U.S. Cl. 424—128 10 Claims

The diseases of milk fever and acetonemia or ketosis in dairy cattle are prevented by feeding to the cattle a feed supplement including dicalcium phosphate, trace mineralized salt and copper sulfate combined at a weight ratio of approximately 1:1:.015, respectively. The supplement is mixed into a base feed mixture of grain products including corn, oats, bran and soybean meal so that the supplement is approximately 2% by weight, of the combined mixture. The supplement may also be used directly for the treatment of ketosis in a drenching procedure.

3,709,988

INSECTICIDAL COMPOSITIONS AND METHODS OF COMBATTING INSECTS USING CYCLOPROPANECARBOXYLATE INSECTICIDES WITH A SYNERGISTIC COMPOUND OF MONO (ALKYL AND ALKENYL) MONO OMEGA-ALKYNYL ARALKYLPHOSPHONATE

Ronald Eugene Montgomery, Middleport, and Harry Hobart Incho, Medina, N.Y., assignors to FMC Corporation, New York, N.Y.

No Drawing. Original application Feb. 18, 1969, Ser. No. 800,264, now Patent No. 3,652,741, dated Mar. 28, 1972. Divided and this application Mar. 8, 1971, Ser. No. 122,168

Int. Cl. A01n 9/02, 9/24, 9/36

U.S. Cl. 424—219 8 Claims

Synergistic insecticidal combinations of esters of certain cyclopropanecarboxylic acids, e.g. pyrethrins, allethrin, and related compounds, with mono(alkyl and alkenyl) mono-ω-alkynyl aryl- and aralkylphosphonates are described. The preparation and properties of representative members of this new class of synergistic phosphonates are described, and test results of their synergistic combinations with representative cyclopropanecarboxylates are reported.

3,709,989

COMPOSITION AND METHOD FOR TREATMENT OF OSSILETS AND PATHOLOGICAL CALCIFICATION IN ANIMALS

Herbert D. Schneyer, Our Lane, Stevenson, Md. 21153

No Drawing. Continuation of application Ser. No. 871,666, Nov. 10, 1969, now abandoned, which is a continuation of application Ser. No. 586,947, Oct. 17, 1966, now abandoned, which is a continuation-in-part of application Ser. No. 318,779, Oct. 22, 1963, now Patent No. 3,279,997, which is a continuation-in-part of application Ser. No. 124,305, July 10, 1961, now abandoned, which in turn is a continuation-in-part of application Ser. No. 836,174, Aug. 26, 1959, now abandoned. This application Sept. 14, 1970, Ser. No. 72,216

Int. Cl. A61k 27/00

U.S. Cl. 424—232 5 Claims

1. A method for treating horses and other animals for ossilets and pathological calcification and preventing the formation thereof comprising dosing daily said horses and other animals, with a medication comprising, in combination about 65 parts enteric coated calcium lactate, about 16 parts enteric coated aspirin, about 5 parts thiamine hydrochloride, and about 5 parts methapyrilene hydrochloride.

3,709,990

METHOD OF INDUCING SIMULTANEOUS MOUNTING OF SILKWORMS

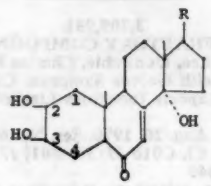
Masaki Kamada and Tetsuo Okauchi, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Continuation-in-part of application Ser. No. 688,001, Dec. 5, 1967. This application May 19, 1970, Ser. No. 38,897

Int. Cl. A61k 17/00

U.S. Cl. 424—243 16 Claims

Simultaneous mounting of silkworms and corresponding improvement of quality of cocoons are achieved by feeding the silkworms a diet containing about 5 to 20 gammas per gram of compound(s) of the formula



wherein the 2- and 3-positioned OH groups are α- or β-oriented, and R is 1,5-dimethylhexyl substituted by 2 to 4 OH groups, or alkanoate(s) thereof with at most 4 carbon atoms, severally or in admixture.

3,709,991

HYPOLIPIDEMIC METHOD

O. Neal Miller, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Nov. 23, 1970, Ser. No. 92,137

Int. Cl. A61u 27/00

U.S. Cl. 424—266 4 Claims

A method of utilizing certain nicotinic acid derivatives as hypolipidemic agents is described.

3,709,992

FUNGICIDAL USE OF CERTAIN CARBOXAMIDOTHIAZOLES

Bogislav von Schmeling, Hamden, Conn., and William A. Harrison and Marshall Kulka, Guelph, Ontario, Canada, assignors to United States Rubber Company, New York, N.Y.

No Drawing. Original application July 7, 1966, Ser. No. 611,197, now Patent No. 3,505,055, dated Apr. 7, 1970. Divided and this application Nov. 18, 1969, Ser. No. 877,824

Int. Cl. A01n 9/12

U.S. Cl. 424—270 9 Claims

This invention relates to the use of carboxamidothiazoles as fungicides.

3,709,993

HYPOCHOLESTEROLEMIC PHENOXY-ALIPHATIC ACID COMPOSITIONS

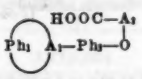
William Laszlo Bencze, New Providence, N.J., assignor to Ciba-Geigy Corporation

No Drawing. Continuation-in-part of application Ser. No. 795,029, Jan. 29, 1969, now Patent No. 3,641,110, which is a continuation-in-part of application Ser. No. 728,871, May 14, 1968, which is a continuation-in-part of application Ser. No. 558,251, June 17, 1966, which in turn is a continuation-in-part of application Ser. No. 323,868, Nov. 15, 1963, the latter three applications now abandoned. This application Apr. 28, 1970, Ser. No. 32,765

Int. Cl. A61k 27/00

U.S. Cl. 424—317 5 Claims

Phenoxy-aliphatic acids, e.g. those of the formula



Ph_1=a 1,2-phenylene
Ph_2=a 1,2-, 1,3-, or 1,4-phenylene
A_1=alkylene forming 5–7 membered ring
A_2=aliphatic hydrocarbon radical

and functional derivatives thereof are hypocholesterolemic agents.

3,709,994

HYDROGENATED ARALIPHATIC ACIDS AS ANTI-INFLAMMATORY AGENTS

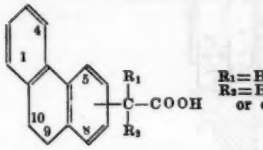
William Laszlo Bencze, New Providence, N.J., assignor to Ciba-Geigy Corporation

No Drawing. Continuation-in-part of application Ser. No. 789,078, Jan. 2, 1969, which is a continuation-in-part of application Ser. No. 714,780, Mar. 21, 1968. This application Mar. 12, 1969, Ser. No. 806,694

Int. Cl. A61k 27/00

U.S. Cl. 424—317 3 Claims

Hydrogenated tricyclic α-aryl-aliphatic acids, e.g. those of the formula



R_1=H or alkyl
R_2=H, alk(en)yl, cycloalk(en)yl or cycloalk(en)yl-alkyl

the dihydro, tetrahydro, hexahydro and functional acid derivatives thereof, are anti-inflammatory agents.

3,709,995

METHOD OF PRODUCING GASTROINTESTINAL SPASMOLYTIC ACTIVITY WITH ALKYLPHENOXYPOLY(ETHYLENEOXY)ETHANOLS

William G. Groves, Blue Bell, Pa., and William J. Tillman, Cherry Hill, N.J., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed Jan. 11, 1971, Ser. No. 105,721

Int. Cl. A61k 27/00

U.S. Cl. 424—341 5 Claims

Pharmaceutical compositions having gastrointestinal spasmolytic activity containing a polyoxyethylene polymer of an alkylphenol in which the polyoxyethylene groups are present from about 10% to about 80% of the molecule and a method of producing gastrointestinal spasmolytic activity.

3,709,996

PHARMACEUTICAL COMPOSITIONS CONTAINING N-CYCLOPROPYL-1-AMINOINDANE COMPOUNDS AND ADAPTED FOR ADMINISTRATION TO OBTAIN INHIBITION OF MONOAMINE OXIDASE ENZYME AND PROCESS

Maurice Ward Gittos, Slough, John William James, Langley, and Leslie Frederick Wiggins, Wargrave, England, assignors to Aspro-Nicholas Limited, London, England

No Drawing. Continuation-in-part of application Ser. No. 623,470, Mar. 15, 1967, which is a continuation of application Ser. No. 385,761, July 28, 1964, now abandoned, and a continuation-in-part of application Ser. No. 855,794, Aug. 18, 1969, now Patent No. 3,534,005, which in turn is a continuation of application Ser. No. 652,029, July 10, 1967, now abandoned. This application Dec. 5, 1969, Ser. No. 882,730

Claims priority, application Great Britain, Aug. 2, 1963, 30,832/63; July 16, 1966, 32,067/66

Int. Cl. A61k 27/00

U.S. Cl. 424—330 11 Claims

N-cyclopropyl-1-aminoindane compounds are provided which act as inhibitors of monoamine oxidase in the animal body and also have adrenolytic activity. A process of inhibiting the action of monoamine oxidase enzyme is also provided, in which such compounds are administered, and pharmaceutical compositions in dosage unit form containing such compounds are provided for this purpose.

3,709,997

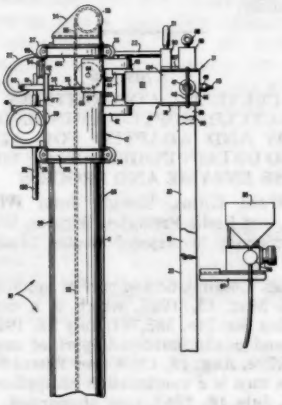
CONVERTIBLE ELECTRODE ELECTRIC FURNACE INSTALLATION AND METHOD

Boris Izrailevich Medovar, Bulvar Lesi Ukrainki, 2, kv. 8; Viktor Andreevich Popov, ulitsa Andreevskaya, 11, apt. 2; Jury Fedorovich Alferov, Bulvar Lepse, 29, kv. 64; Alexey Georgievich Bogachenko, ulitsa Milyutenko, 15/2, apt. 141, and Jury Vadimovich Latash, Vozdukhoflotsky prosp. 81/2, kv. 14, all of Kiev, U.S.S.R.

Filed Dec. 22, 1970, Ser. No. 100,709

Int. Cl. H05b 7/12

U.S. Cl. 13—14 58 Claims



An electric furnace installation in which a simple interchangeability of electrode clamping assemblies is provided to permit electrode melting operation in which single or plural electrodes can be mounted on the basic furnace tower for melting in a crucible means. The interchangeable electrode clamping assemblies are designed for ease of rapid removal from and rapid connection onto an upper carriage of the basic furnace. A lower carriage which helps support and stabilize the crucible can accommodate crucibles for single and for plural electrode melting.

3,709,998

HEATING ELEMENT FOR AN ELECTRIC FURNACE

Anne-Marie Anthony, Meudon; Michele Faucher, Fontenay-le-Fleury, and Krzysztof Dembinski, Tigy, all of France, assignors to Agence Nationale de Valorisation de la Recherche (Anvar), Puteaux, France

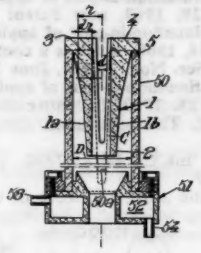
Division of Ser. No. 825,306, May 16, 1969. This application Dec. 16, 1970, Ser. No. 98,831

Claims priority, application France, May 1, 1968, 68152366; Oct. 24, 1968, 68171236; Dec. 31, 1968, 68182837

Int. Cl. H05b 3/06

U.S. Cl. 13—25 4 Claims

The heating element is made of a refractory material resistant to oxidation, and comprises two hollow hemicylindrical parts disposed face to face by their concave portions at a slight distance from each other. These two parts are supplied with electric current at one of their ends and are connected together at their other end by a common cylindrical part. The exterior radii of the hemicylindrical parts and of the common cylindrical part, and the thicknesses of these parts, as well as the distance between the corresponding opposing edges of the two hemicylindrical parts, all decrease from the end by which



the current is supplied to the end which is connected together by the common cylindrical part.

3,709,999

VACUUM INDUCTION HEAT TREATMENT OF LONG TUBULAR PRODUCTS

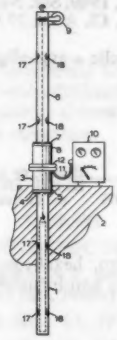
Kenneth T. Bates, Dundas, Ontario, and Michael R. Hoare, Burlington, Ontario, both of Canada, assignors to Westinghouse Canada Limited, Hamilton, Ontario, Canada

Filed July 30, 1970, Ser. No. 59,623

Claims priority, application Canada, Sept. 29, 1969, 063,460

Int. Cl. H05b 5/00

U.S. Cl. 13—26 3 Claims



This invention relates to a long tubular furnace which is composed of two or more sections which are separable in the central section of the furnace. The contained article undergoing treatment is moved at a controlled rate through the central section of the furnace where an induction heater provides the required heating energy.

3,710,000

HYBRID SUPERCONDUCTING MATERIAL

Walter J. Shattes, Bloomfield, and William G. Marancik, Basking Ridge, both of N.J., assignors to Air Reduction Company, Incorporated, New York, N.Y.

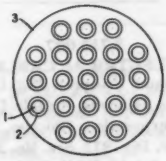
Filed May 13, 1970, Ser. No. 36,740

Int. Cl. H01b 7/34, 5/00

U.S. Cl. 174—15 C 7 Claims

A hybrid superconducting material in which superconducting strands, at least partially surrounded by a layer of low resistance normally conducting material, are embedded in a matrix of high resistance normally conducting material. In a

specific embodiment, the superconducting strands consist essentially of niobium titanium, individually surrounded by a thin sleeve of copper, and embedded in a matrix of cupro-



nickel. The composite is extruded at elevated temperatures and pressure. The wire so formed may be used for electromagnet coils designed to function in a cryogenic system.

3,710,001

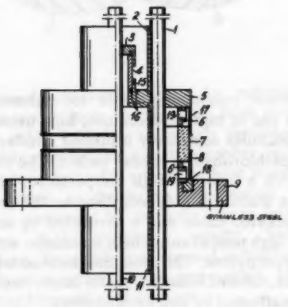
VACUUM TIGHT HIGH-FREQUENCY COAXIAL LEAD-THROUGH CAPABLE OF HANDLING HIGH POWER

Andre Besson, Massy, France, assignor to Societe de Traitements Electrolytiques et Electrothermiques

Filed Aug. 16, 1971, Ser. No. 172,136

Int. Cl. H01b *17/26*

U.S. Cl. 174—15 BH **10 Claims**



A vacuum-tight, coaxial, high-frequency lead-through with high power handling capability, cooled by circulation of a liquid, including: an outer and a central copper conductor vacuum-tightly connected together by means of a ceramic cylindrical component, whose one end is brazed to a sleeve integral with a disk-shaped copper component vacuum-tightly attached to the central conductor, and whose other end is brazed to a sleeve integral with another disk-shaped copper component attached to the external conductor.

3,710,002

AN UNDER-GROUND VENTED NON-METALLIC TRANSFORMER ASSEMBLY

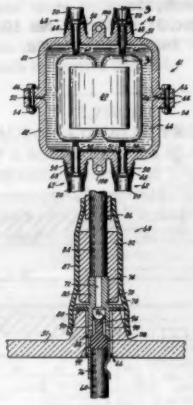
Edwin A. Link, 317 South Greenfield Avenue, Waukesha, Wis.

Continuation-in-part of Ser. No. 15,757, March 2, 1970, abandoned. This application June 9, 1971, Ser. No. 151,463

Int. Cl. H01f *27/04*

U.S. Cl. 174—18 **14 Claims**

A distribution transformer assembly for an electrical power distribution system, the transformer assembly including a fluid-tight non-metallic enclosure which can be buried in the ground, a distribution transformer having a primary and a secondary winding positioned within said enclosure, said enclosure including sealed primary and secondary electrical terminators or bushings for operatively connecting the transformer to the distribution system and insulating liquid substantially filling said enclosure to dissipate heat losses through the



walls of the enclosure to the adjacent ground, at least one of the terminators having a one-way vent to the atmosphere.

3,710,003

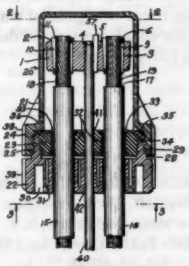
CONNECTING BLOCK AND HOUSING FOR USE IN UNDERGROUND RESIDENTIAL POWER DISTRIBUTION

William H. Channell, 122 Oak Tree Drive, Glendora, Calif.

Filed April 16, 1971, Ser. No. 134,759

Int. Cl. H02g *9/02;* **H01r** *7/06*

U.S. Cl. 174—37 **4 Claims**



The device comprises a collector ring or connector block provided with a series of uniform diameter transverse bores or holes. These holes are for passage therein of bare cable. A collet is provided for each hole, the external diameter of the collet fitting within a hole of the collector ring and the center bore of the collet receiving a bare cable. The collets are thrust within the holes of the collector ring under hydraulic pressure whereby each collet engages the bare cable over 360° and, likewise, the same number of degrees in the collector ring. This results in a connection which is not subject to hot spots and provides what is termed a cold joint. The current carrying capacity of the collector ring must be equal to or greater than the current carrying capacity of cables at the point of attachment. A housing is provided for the collector ring comprising a sealing adapter and a cap or dome. In addition there is a neoprene sealing grommet having holes through which the insulated cable is passed. The sealing adapter and the dome or cap are screw threaded together sealing on the outer top edge of the sealing grommet.

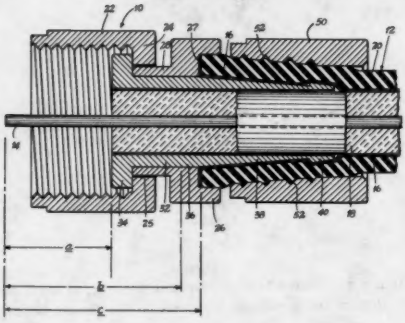
3,710,004

Patent Not Issued For This Number

3,710,005
ELECTRICAL CONNECTOR

Gerald H. French, Overland, Mo., assignor to Mosley Electronics Inc., St. Louis, Mo.

Filed Dec. 31, 1970, Ser. No. 103,115
Int. Cl. H02g 15/08
U.S. Cl. 174—89 3 Claims

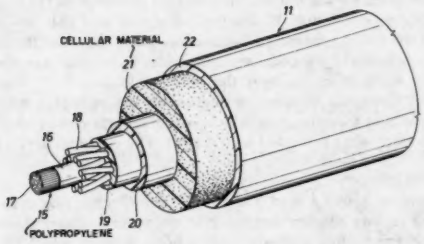


This invention relates to a connector for terminating the end of a cable, the cable including a center conductor, a coaxial shield separated from the center conductor by dielectric material, and an outer insulating jacket covering the shield. The connector includes a mandrel having a shank portion extending between the dielectric material and the shield, a connection means in electrical engagement with the mandrel, and means for holding the shank portion of the mandrel between the shield and dielectric material.

3,710,006
MARINE STREAMER CABLE

Billy W. Davis, Flagstaff, Ariz., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed July 1, 1971, Ser. No. 158,838
Int. Cl. H01b 7/12
U.S. Cl. 174—101.5 2 Claims

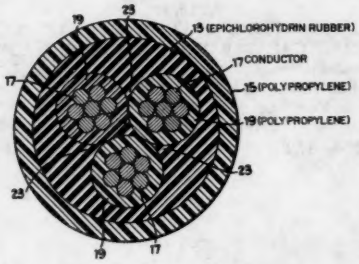


A marine streamer cable of layered solid construction and having substantially the same composition density as sea water, comprising a flotation layer surrounding a cable core having as a central stress member a polypropylene rope made with paralleled fibers held together by an extruded plastic jacket, the use of which minimizes the weight of the cable and serves to greatly attenuate the propagation along the cable of mechanical noise.

3,710,007
ELECTRICAL CABLE

Donald F. Hoeg, Mount Prospect, Ill.; Leo V. Legg, Tulsa, Okla., and Donatas Tijunelis, Buffalo Grove, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 16, 1971, Ser. No. 208,624
Int. Cl. H01b 7/02
U.S. Cl. 174—120 AR 4 Claims

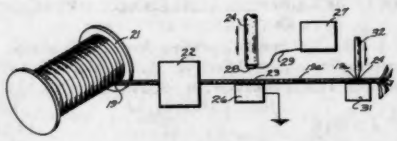


An electrical conducting cable for submersible motors adapted for use in high temperature, high pressure oil wells. The cable includes separately insulated conductors disposed within an epichlorohydrin rubber jacket. The conductors are insulated with a layer of high temperature, high molecular weight, heat stabilized polypropylene as the primary insulation. The jacketed cable unit is protected by an outer armor formed of a high temperature, high molecular weight, heat stabilized, polypropylene. The cable thus formed is flexible, abrasion resistant, solvent resistant, liquid impervious, heat in sensitive and unaffected by well environment.

3,710,008
STRANDED CONDUCTOR AND METHOD OF MAKING SAME

Roderick V. Sawyer, Elkhard, Ind., assignor to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 765,791, Oct. 8, 1968, Pat. No. 3,579,165.
This application March 2, 1971, Ser. No. 120,131
Int. Cl. H01b 5/10
U.S. Cl. 174—131 A 5 Claims



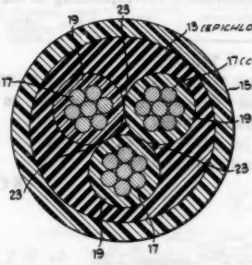
Strands of material along selected segments of an indeterminate length of stranded conductive material are welded together and severed to provide predetermined lengths of stranded conductive material having the strands at the ends thereof secured together to prevent unraveling. Each strand

comprises a pliant fiber core about which is wrapped a conductive foil. Such pieces of conductive material are secured to one or more coil lead wires to form a pair of terminal leads in a coil assembly.

3,710,009
ELECTRICAL CABLE

Donald F. Hoeg, Mt. Prospect, Ill.; Leo V. Legg, Tulsa, Okla., and Donatas Tijunelis, Buffalo Grove, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 16, 1971, Ser. No. 208,643
Int. Cl. H01b 7/02
U.S. Cl. 174—120 AR **6 Claims**

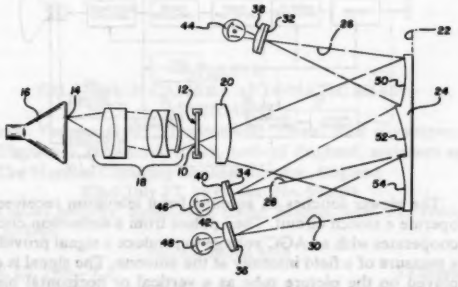


An electrical conducting cable for submersible motors adapted for use in high temperature, high pressure mineral wells. The cable includes separately insulated conductors disposed within an epichlorohydrin rubber jacket. The conductors are insulated with a layer of heat stabilized ethylene propylene rubber as the primary insulation. The jacketed cable unit is protected by an outer armor formed of a high temperature, high molecular weight, heat stabilized, polypropylene. The cable thus formed is flexible, abrasion resistant, solvent resistant, liquid impervious, heat insensitive and unaffected by well environment.

3,710,010
REFLECTIVE DEVICE FOR COLOR SEPARATION

John W. Balliett, and William T. Sherwood, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 76,935, Sept. 30, 1970, abandoned. This application July 1, 1971, Ser. No. 158,758
Int. Cl. H04m 9/02
U.S. Cl. 178—5.4 R **4 Claims**

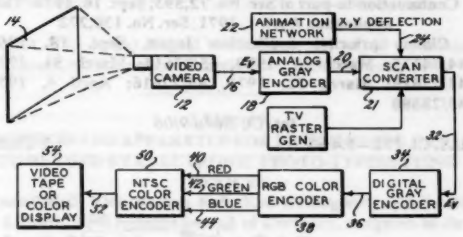


An image is focused upon a reflective device having a plurality of arcuate reflective surfaces, each surface being operative to reflect a portion of the image upon an associated photosensitive device. In particular, three photosensitive devices, each sensitive for example to a primary color of red, green or blue, and three arcuate reflective surfaces are arranged to translate the respective red, green and blue color components of an image focused upon the arcuate reflective surfaces into signals indicative thereof.

3,710,011
SYSTEM FOR AUTOMATICALLY PRODUCING A COLOR DISPLAY OF A SCENE FROM A BLACK AND WHITE REPRESENTATION OF THE SCENE

William C. Altemus, and James Duca, both of Littleton, Colo., assignors to Computer Image Corporation, Denver, Colo.

Filed Dec. 4, 1970, Ser. No. 95,096
Int. Cl. H04n 9/12
U.S. Cl. 178—5.4 R **37 Claims**

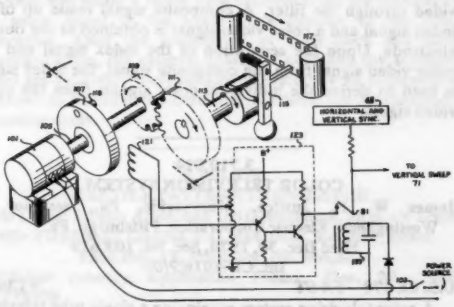


This invention comprises a system for producing a color representation on either video tape or a color display device of a static or dynamic scene, each color being independently selective and variable. Signals are generated for representing the scene in discrete shades of gray, which signals are used to generate further signals representing the red, green and blue components of a color assigned to each gray shade. These red, green and blue component signals are used to produce the color representation. The system further includes means for selecting the colors assigned to the various gray shades, and exclusive logic means allowing independent selection and variation of each color. Means are also provided for animating the scene to produce a fully animated color representation.

3,710,012
COLOR IMAGE DISPLAY SYSTEM

Donald John Cross, Tonawanda; Robert Roy Eckenbrecht, East Bethany; Arthur Burke Price, Byron, and Benton Boyd Scott, Batavia, all of N.Y., assignors to Sylvania Electric Products Inc.

Filed Dec. 30, 1968, Ser. No. 787,962
Int. Cl. H04h 9/02, 9/14
U.S. Cl. 178—5.2 **7 Claims**



A system for providing a color image display derived from color television signals and photographic film includes a color

image reproducer; first signal source means responsive to color television signals to provide signals representative of luminance, chrominance and synchronizing information; second signal source means responsive to light-scanned photographic film to provide signals representative of luminance and chrominance information; transport means for effecting conveyance of a film through said second signal source means and synchronization of said film conveyance and said first signal source means; and switching means for selective coupling of signals representative of luminance and chrominance information from said first and second signal source means to said color image reproducer.

3,710,013

SINGLE TUBE COLOR TELEVISION CAMERA WITH INDEXING MEANS

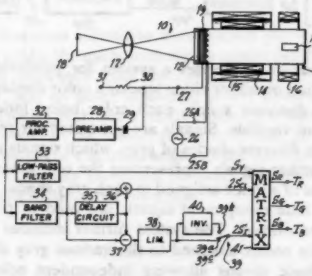
Yasuharu Kubota, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 72,593, Sept. 16, 1970. This application April 1, 1971, Ser. No. 130,272

Claims priority, application Japan, Sept. 18, 1969, 44/74175; March 31, 1970, 45/27614; March 31, 1970, 45/27615; March 31, 1970, 45/27616; April 4, 1970, 45/28880

Int. Cl. H04n 9/06

U.S. Cl. 178—5.4 ST **8 Claims**



A color television camera utilizes a vidicon tube having a filter in the form of triads of stripe-like filter elements for the primary colors red, blue and green, sets of electrodes arranged in pairs for each filter element triad and being electrically separated from the photoconductive layer at the side of the latter facing toward the electron gun, and an output or signal electrode apart from the sets of electrodes. An alternating voltage is applied to the sets of electrodes to provide, on the photoconductive layer, a predetermined potential pattern representing an index signal which is overlapped with the color component images of the object to be reproduced provided through the filter. A composite signal made up of an index signal and a color video signal is obtained at the output electrode. Upon the separation of the index signal and the color video signal from the composite signal, the index signal is used to derive the individual color signals from the color video signal.

3,710,014

COLOR TELEVISION SYSTEM

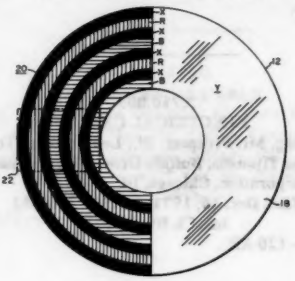
James W. H. Justice, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1970, Ser. No. 102,619

Int. Cl. H01n 9/06

U.S. Cl. 178—5.4 ST **9 Claims**

A color television system employing a single tube television camera wherein a filter wheel permits the transmission of luminance information to the camera during a first field and bicolor information, consisting of two primary colors, during a second field, with the video information corresponding to the luminance and bicolor information being transmitted for



processing into video information corresponding to the three primary colors.

3,710,015

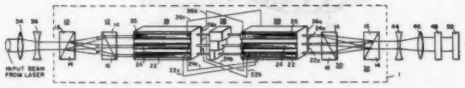
OPTICAL PROCESSOR FOR LASER DISPLAY SYSTEM

Vernon J. Fowler, East Meadow, N.Y., assignor to GTE Laboratories, Inc., Waltham, Mass.

Filed March 16, 1971, Ser. No. 124,799

Int. Cl. H04n 9/12

U.S. Cl. 178—5.4 BD **8 Claims**



An optical processor for a laser display system separates and provides individual modulation for a number of coaxial components of light contained within a multiwavelength laser beam. The optical processor is capable of operating with the video signals of conventional color television signals as part of a laser color television display system.

3,710,016

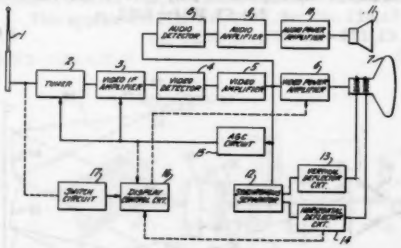
TELEVISION RECEIVER WITH FIELD INTENSITY INDICATOR

Yoshio Fujio; Yoshihiro Kitamura; Koji Mihara, and Tsuneakira Hamada, all of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1970, Ser. No. 61,907

Int. Cl. H04n 5/60

U.S. Cl. 178—5.8 R **5 Claims**



The viewer touches an antenna for a television receiver to operate a switch circuit. Then pulses from a deflection circuit cooperates with an AGC voltage to produce a signal providing a measure of a field intensity at the antenna. The signal is displayed on the picture tube as a vertical or horizontal band. The antenna is moved to and fixed at its position where the band has the narrowest width.

3,710,017
TV RECEIVER CONCURRENTLY ACTING AS A MONITOR

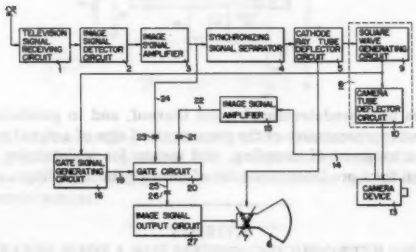
Takuzi Abe, Tokyo, and Minoru Yuda, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 3, 1971, Ser. No. 139,564

Claims priority, application Japan, May 8, 1970, 45/44327; May 8, 1970, 45/44328; Aug. 10, 1970, 45/69315; Aug. 10, 1970, 45/78859; Sept. 21, 1970, 45/92912; Sept. 21, 1970, 45/92914

Int. Cl. H04n *5/22, 5/48, 7/02*

U.S. Cl. 178—6.8 **16 Claims**



A TV receiver concurrently acting as a monitor comprising means for separating TV synchronizing signals from detected TV image signals; camera tube deflecting means including a device for generating in synchronization with said separated TV synchronizing signals square wave synchronizing signals having a width equal to $1/n$ (n 1) of the period of the first mentioned TV synchronizing signals thereby to supply deflecting signals corresponding to the width of said square wave signals to the image pickup tube of the camera and scan said image pickup tube with a period $1/n$ times that of scanning TV image signals; a camera device for producing image signals by said deflecting means; means for obtaining gate signals from horizontal and vertical square wave synchronizing signals; means for generating composite image signals by selectively drawing out TV image signals and camera image signals in prescribed timing according to said gate signals; and means for supplying said composite image signals to the receiving tube, thereby simultaneously reproducing part of a TV image and the whole of a camera image.

3,710,018
TELEVISION CAMERA AUTOMATIC BEAM ALIGNMENT

Derek Vernon Ryley, Ingatestone, Essex, and Gyongyver Claydon, Chelmsford, Essex, both of England, assignors to The Marconi Company Limited, London, England

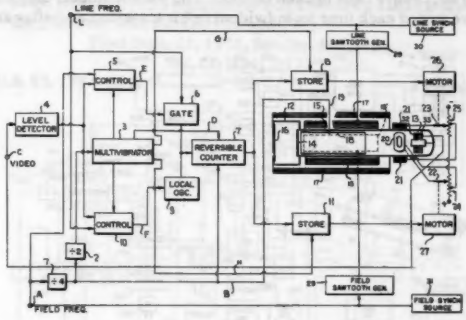
Filed July 17, 1970, Ser. No. 55,656

Claims priority, application Great Britain, Aug. 11, 1969, 40,075/69

Int. Cl. H04n *3/16*

U.S. Cl. 178—7.2 **3 Claims**

A television camera which includes a cathode ray tube has an arrangement for aligning the beam and providing beam focusing in which the focusing field is modulated while the tube scans a test card. The test card has a predetermined pattern of light and shade which causes a change in camera tube



output. This output is used to automatically adjust the beam alignment in relation to the modulating of the focusing field.

3,710,019
METHOD AND APPARATUS FOR DETERMINING DATA TO BE USED BY ELECTRONIC PHOTO-TYPESETTING DEVICES

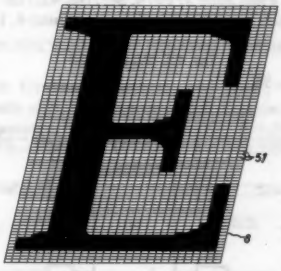
Rudolf Hell, Kiel; Roman Koll, Kiel-Wellingdorf, and Ewald Lifferth, Kiel-Kronshagen, all of Germany, assignors to Dr. Ing. Rudolf Hell Kommanditgesellschaft

Filed Aug. 10, 1970, Ser. No. 62,487

Claims priority, application Germany, Aug. 11, 1969, P 19 40 797.7

Int. Cl. H04n *1/10*

U.S. Cl. 178—7.6 **6 Claims**



Data for setting italic characters by electronic photo-typesetting devices is determined by reciprocating an original card containing the italic character and a scanning head adapted for measuring light and dark markings relative to one another and along a linear path inclined from the vertical by an angle equal to the angle of inclination of the italic character. After the completion of each back and forth scanning cycle, the original character card and the scanning head are relatively, horizontally displaced by an incremental amount to position the card and the head for a subsequent scanning cycle.

3,710,020
TEXTILE PATTERN TRANSLATOR

Arie Levin; Efraim Arazi, and Uri Gronemann, all of c/o Scientific Technology Limited, P.O. Box 1028, Rehovot, Israel

Filed Dec. 15, 1969, Ser. No. 884,802

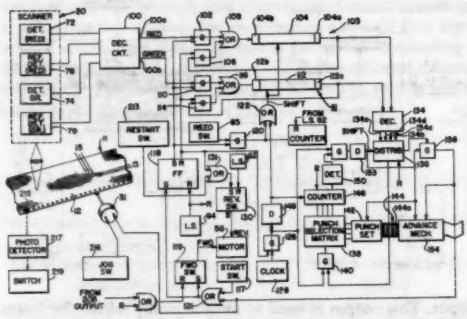
Claims priority, application France, Dec. 20, 1968, 68179558

Int. Cl. H04n *9/02*

U.S. Cl. 178—5.2 R **24 Claims**

A machine for translating a graticulated textile design pattern to a format readable by a textile machine incorporates

color-sensitive photodetectors mounted in a scanner head. The scanner head automatically scans successive columns of the design pattern so that the photodetectors sense the colors of successive cells in each column. The photodetector outputs are stored each time an individual cell is traversed and after an



entire column has been scanned, the stored information is decoded to the format necessary to control a card punching machine. Additionally, the output from the decoding machine may be used to control a pattern verifier which utilizes decoded information to reproduce the design pattern being scanned.

3,710,021

CIRCUIT ARRANGEMENT FOR THE CONNECTION OF A LOW VOLTAGE DIRECT CURRENT DATA TRANSMISSION SYSTEMS TO A DATA EXCHANGE

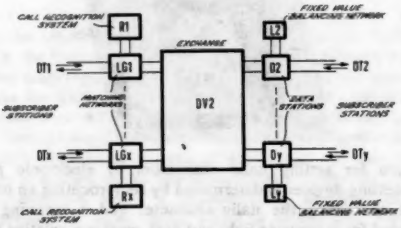
Rainer Gaiser; Ekkehard Riedel, and Lothar Schmid, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed June 2, 1970, Ser. No. 42,728

Claims priority, application Germany, June 4, 1969, P 19 28 434.5

Int. Cl. H04l *11/20*

U.S. Cl. 178—58 **5 Claims**



A circuit arrangement is described for interconnecting data transmission subscribers through a data exchange in a system where low transmission voltages are used. Each subscriber is connected through the exchange over a two-wire line carrying duplex traffic. A matching network is provided adjusting the electrical length of each subscriber line on the arriving side of the exchange to correspond with the longest existing line.

3,710,022

SAMPLING AND RETIMING CIRCUIT FOR PCM REPEATERS

Frederick Nordling, Sausalito, Calif., assignor to Lynch Communication Systems, Inc., San Francisco, Calif.

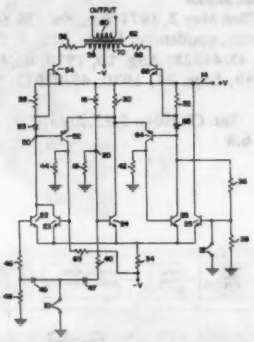
Division of Ser. No. 4,636, Jan. 21, 1970, Pat. No. 3,633,045.

This application April 12, 1971, Ser. No. 133,386

Int. Cl. H04l *25/52*

U.S. Cl. 178—70 R **12 Claims**

In a system for the transmission of information coded in terms of the presence and polarity of pulses in a signal pulse train, a circuit for reconstituting degraded pulses comprising a source of degraded signal pulses to be reconstituted, dual limit detector means arranged to momentarily sample the signal



pulses at a predetermined point thereof, and to produce an output representative of the presence and sign of a signal pulse at the moment of sampling, and means for maintaining this output for a predetermined time following the sampling.

3,710,023

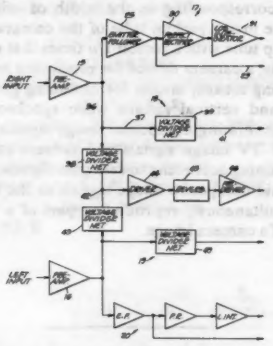
SOUND REPRODUCING SYSTEM FOR A FOUR SPEAKER STEREO UTILIZING SIGNAL EXPANSION AND SIGNAL DELAY

Charles E. Greuzard, Sr., and Charles E. Greuzard, Jr., both of Garden Grove, Calif., assignors to International Technical Development Corporation, Los Angeles, Calif.

Filed Sept. 27, 1971, Ser. No. 183,825

Int. Cl. H04r *5/00*

U.S. Cl. 179—1 G **10 Claims**

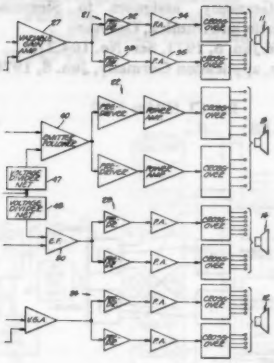


Four speaker systems are arranged at the corners of a rectangle encompassing the listener; two at the front of the listening area and two at the rear. The input sound information is converted into four separate and individual channels which are connected to the respective four speaker systems.

The sound information is, first of all, directed along a first branch to a variable gain amplifier, after which it enters a conventional preamplifier and power amplifier for energizing one of the front speaker systems. The sound is also supplied to a second branch for rectification and integration, after which it is connected to the input of the variable gain amplifier of the first branch. The original sound signal is similarly treated in a further channel and applied to the other front speaker systems.

Each of the rear speaker systems is provided with energization input from the sound signals and admixed with active delay.

The present invention pertains generally to a sound reproducing system, and, more particularly, to a sound reproducing system in which a plurality of speaker systems ar-



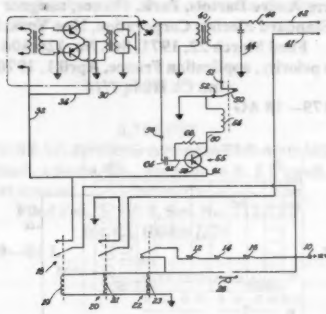
ranged in surrounding relationship to the listener are provided with separate energization that is selectively controlled to recreate true recording ambience or produce a unique listening environment.

3,710,024

PROTECTIVE TELEPHONE ALARM SYSTEM

Warrick T. Lacey, 1042 Roxbury Court, Columbus, Ohio

Filed Nov. 12, 1970, Ser. No. 88,583
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 P **8 Claims**



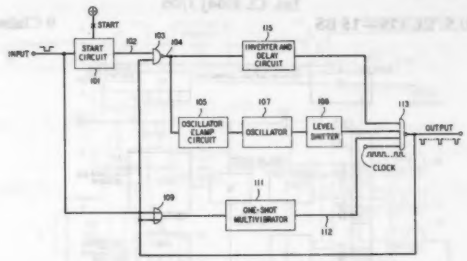
A protective alarm for automatically connecting itself to a telephone line, dialing a remote telephone and delivering an audio message to the remote telephone, in response to an intrusion. The alarm has a magnetic tape and an associated tape player. On the tape is recorded a 5-kilohertz control signal 100 percent modulated by telephone dialing pulses which are followed by an oral message that is superimposed on the continous control signal. A dialing switch connects the audio output of the tape player to the telephone line when an intrusion switch located, for an example in a window, is opened. A bipolar transistor controls the dialing switch. The transistor is biased to cause the dialing switch to disconnect the telephone from the alarm system. The transistor circuit responds to the presence of the control signal by connecting the alarm to the telephone line when the control signal is present. An intrusion opens an intrusion switch, begins the magnetic tape player which, in turn, permits the modulated control signal to turn the dialing switch on and off and thereby dial a remote phone. The oral message is then delivered to the remote location.

3,710,025

TIME SLOT MEMORY CIRCUIT

William Joseph Laggy, Middletown, N.J., and Harold Frederick May, Holmdel, N.J., assignors to Bell Telephone Laboratories Inc., Murray Hill, Berkeley Heights, N.J.

Filed Sept. 21, 1971, Ser. No. 182,373
Int. Cl. H04j *3/12*
U.S. Cl. 179—15 A **7 Claims**



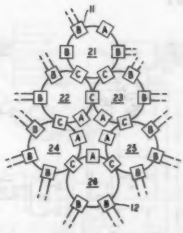
We disclose a dynamic time slot memory circuit for use in a time division switching system. This memory circuit is responsive to an input pulse in a time slot to thereafter provide output pulses in that time slot at the system frame rate. An oscillator is utilized as the memory element to remember the system sampling frequency. The output of a monostable multivibrator triggered by the input pulse, the output of a system clock providing pulses defining time slots, and a positive zero-crossing of the oscillator output are combined to provide an output pulse during the next frame in the time slot in which the input pulse occurred. This output pulse is fed back as an input to the time slot memory circuit to restart the cycle.

3,710,026

INTERCONNECTED LOOP DIGITAL TRANSMISSION SYSTEM

Ronald Lewis Graham, Chatham, and Henry Otto Pollak, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed March 1, 1971, Ser. No. 119,724
Int. Cl. H04j *3/08*
U.S. Cl. 179—15 AL **17 Claims**

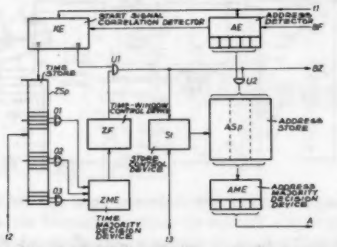


A digital communication loop system is disclosed wherein transfers of signal message blocks between intersecting loops are only made when a Hamming distance criterion is satisfied. More particularly, a decision to switch from one loop to another interconnecting loop is made when the Hamming distance between the interconnecting loop address and the final destination loop address is less than the Hamming distance between the loop address in which the message block currently resides and the final destination loop address.

3,710,027
SYSTEM OF TIME-DIVISION MULTIPLEX TRANSMISSION VIA COMMUNICATIONS SATELLITES

Eberhard Herter, Stuttgart, and Peter Conrad Ulrich, Heutigsheim, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 27, 1970, Ser. No. 84,287
Claims priority, application Germany, Nov. 22, 1969, P 19 58 673.3
Int. Cl. H04j 3/06
U.S. Cl. 179—15 BS 9 Claims

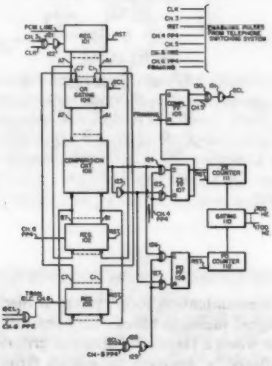


A system at each station is described to detect the beginning of a message first containing a start signal and to detect the station address in a TDMA system. The system stores detected suspected signals for a number of preceding frames that occur in an expected time slot. A first majority decision is made with respect to the stored start signal and if a positive decision is made the next detected start signal is accepted for processing. A positive decision for the start signal majority decision enables the station addresses to be evaluated by a second majority decision. This arrangement eliminates the need of redundancy codes for the start signal and the station address, said redundancy codes occupying too much space in the available time slot.

3,710,028
DETECTOR FOR DIGITALLY TRANSMITTED MULTIFREQUENCY TONES AS UTILIZED FOR SIGNALING IN A PULSE CODE MODULATED TELEPHONE SYSTEM

Satyan G. Pitroda, Villa Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 10, 1970, Ser. No. 88,428
Int. Cl. H04q 1/00
U.S. Cl. 179—15 BY 6 Claims

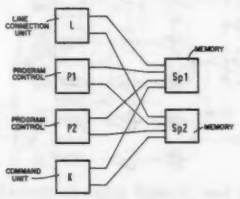


A technique for detecting multifrequency tones on a digital basis in a pulse code modulated telephone system. Tone pairs are detected based on a determination of the quantity of zero slope counts and peak detector counts for a specific period of time.

3,710,029
SWITCHING ARRANGEMENT FOR A DATA PROCESSING INSTALLATION

Gunter Grossman; Hans-Ulrich Moder, and Rolf Schubert, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jan. 6, 1971, Ser. No. 104,275
Claims priority, application Germany, Jan. 8, 1970, P 20 00 608.0
Int. Cl. H04m 3/00
U.S. Cl. 179—18 ES 12 Claims

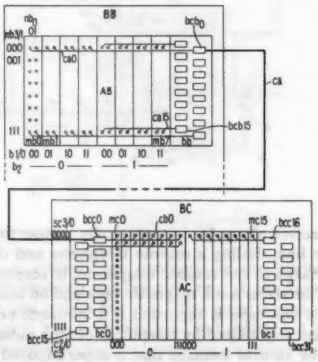


A program controlled data processing installation is disclosed including program control units for carrying out the necessary system operations and memory storage devices for storing the necessary programs. The program control unit includes primary registers and an auxiliary storage unit including secondary registers to which immediate access is not required. The auxiliary storage unit is connected to the primary registers so that operations required by system commands may be carried out.

3,710,030
NETWORK INTERSTAGE GRADING ARRANGEMENT

Jean-Pierre Andre Dartois, Paris, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed March 22, 1971, Ser. No. 126,404
Claims priority, application France, April 1, 1970, 7011616
Int. Cl. H04q 1/16
U.S. Cl. 179—18 AG 4 Claims



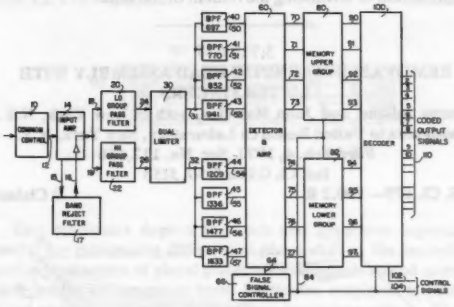
A switching network is provided by which the outputs of a stage and the inputs of the next stage each bear a number, the numbers of an output and of an input interconnected by a link are related by relations so that, whatever the application is, certain digit-to-digit correspondences (b_i=c_i, for example) are always maintained. This makes it possible to define output groups and input groups to be connected via link groups, the arrangement of the link groups being the only one which varies with the application. The invention allows grading between selection stages in a telephone or telegraph exchange, without using a distribution frame.

3,710,031

MULTI FREQUENCY RECEIVER

Daniele Sellari, Jr., Corinth, Miss., assignor to International Telephone and Telegraph Corporation

Filed Dec. 23, 1970, Ser. No. 100,950
Int. Cl. H04m *1/50*; H04q *9/12*
U.S. Cl. 179—84 VF 8 Claims



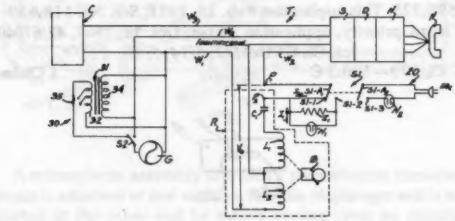
A multi-frequency or voice frequency receiver is employed in telecommunication systems to receive and test digital signals from stations having multi-frequency control signalling facilities, and to receive digital information from similarly equipped data transmitting stations. The receiver has a number of tests which it performs on the received signals prior to passing the signals to the translators and decoders. The signals used are the standard eight tone, two group signals which are checked as to frequency, duration, the presence of one tone per group, minimum amplitude level and signal amplitude. In the receiver, the filter networks employ active filtering principles.

3,710,032

TELEPHONE SILENCING APPARATUS AND METHOD

Lee: Maw-huei, Atlanta, Ga., assignor to B. J. Powell, Decatur, Ga., a part interest

Filed Feb. 3, 1971, Ser. No. 112,122
Int. Cl. H04m *1/26*
U.S. Cl. 179—84 L 10 Claims



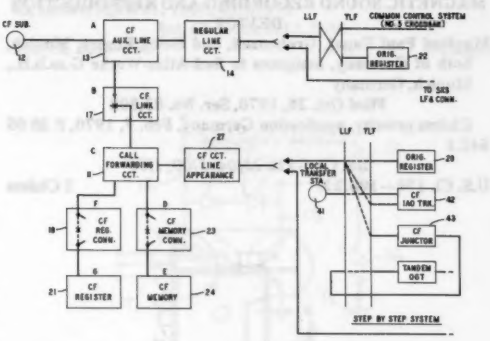
Method and apparatus for selectively silencing the bell of a telephone wherein the method comprises selectively reducing the resultant magnetomotive force through the ringer circuit to a value below that necessary to ring the bell. The method also includes selectively increasing the ringing voltage output from the central system generator with a transformer to increase the current level in the ringer circuit and thus the magnetomotive force above that necessary to ring the bell.

3,710,033

CALL FORWARDING ARRANGEMENT FOR TELEPHONE SYSTEMS

Wiley Whitney, 2829 N.E. 33rd Ct. Apt. 603, Fort Lauderdale, Fla.

Filed June 11, 1971, Ser. No. 152,090
Int. Cl. H04m *3/54*
U.S. Cl. 179—18 BE 12 Claims



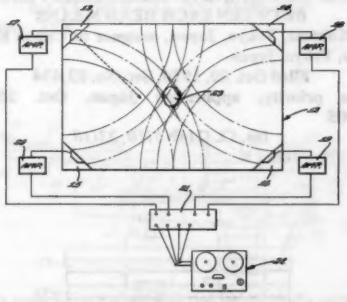
A call forwarding arrangement, which is particularly applicable in connection with telephone exchanges having a relatively few call forwarding customers, utilizes a group of selectable call forwarding circuits together with selectable memory devices which are used only while the call forwarding line is in the transfer condition. A crossbar link circuit is utilized in conjunction with the group of selected call forwarding circuits, each call forwarding line having a vertical appearance on the crossbar switch of the link circuit while the call forwarding circuits of the group are connected to the horizontals. No modifications of the existing central office equipment are involved; all facilities of the CF service being added as auxiliary equipment.

3,710,034

MULTI-DIMENSIONAL SONIC RECORDING AND PLAYBACK DEVICES AND METHOD

Edward J. Murry, Palos Park, Ill., assignor to Fibra-Sonics, Inc., Chicago, Ill.

Filed March 6, 1970, Ser. No. 17,079
Int. Cl. G11b *21/00*, *23/18*; H04h *5/00*
U.S. Cl. 179—100.1 TD 10 Claims



A method and apparatus for recording sonic material so that it may be used to achieve accurately a multi-dimensional playback sonic effect highly similar to that of the original material experienced in the playing volume such as that of an auditorium, studio or theater and accomplishing this in volumes which do not necessarily duplicate the recording location. A novel enclosure which may be used as a high gain type planal microphone enclosure is disclosed as well as a

system of recording/playback which incorporates delimiting the recording and playback space in such a manner that the volume of the original recording space may be duplicated by means of selectively time delaying various channels of a recording system relative to each other.

3,710,035
HOUSING AND SPEAKER ARRANGEMENT FOR MAGNETIC SOUND RECORDING AND REPRODUCTION DEVICE

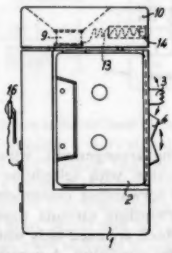
Manfred Paul Tupaj, Grobenzell, and Heinz Engert, Munich, both of Germany, assignors to Sud-Atlas-Werke G.m.b.H., Munich, Germany

Filed Oct. 26, 1970, Ser. No. 83,802

Claims priority, application Germany, Feb. 7, 1970, P 20 05 641.1

Int. Cl. G11b *23/04, 5/00, 1/00*

U.S. Cl. 179—100.2 Z **2 Claims**



A device for magnetic sound recording and reproduction includes a housing arranged to receive a sound tape cassette and a speaker unit detachably connected to one surface of the housing. The speaker unit contains projecting plug pins which fit into sockets in the housing of the device for securing the speaker unit in place. The speaker unit may cover one lateral surface of the housing or, if a larger speaker is to be used, it may cover a face surface and project over and be connected into a lateral surface of the housing. Additional sockets of plug connections can be provided in the housing to connect a microphone, speaker, record player and the like.

3,710,036
ANTI-CROSSTALK SYSTEM FOR MULTI-TRACK MULTIPLE HEAD DEVICE WITH LONGITUDINALLY SPACED HEAD MEANS, SHIELDING CASES FOR EACH HEAD MEANS, AND AN ERASE HEAD PLACED BETWEEN EACH HEAD MEANS

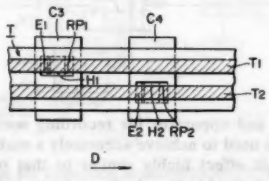
Yutaka Kohtani, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1970, Ser. No. 82,434

Claims priority, application Japan, Oct. 25, 1969, 44/101005

Int. Cl. G11b *5/10, 23/18*

U.S. Cl. 179—100.2 K **3 Claims**



The magnetic head arrangement of this invention includes a first magnetic head, an erase head, a second magnetic head, a first shielding case to house the first magnetic head and a second shielding case to house the erase head and the second magnetic head. The first recording head faces a first track on a magnetic tape and has the function of reproducing the information stored on that first track. The second magnetic head functions as the recording head and, together with the erase head, faces a second recording track at a position spaced from the first magnetic head with respect to the running direction of the tape. Within the second shielding case the second magnetic head is disposed behind the erase head with respect to the direction of advancing movement of the tape.

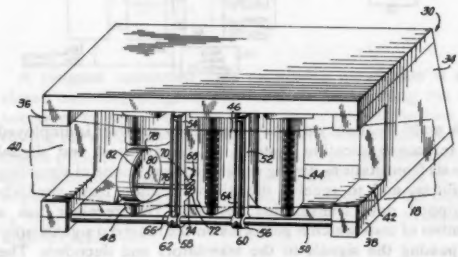
3,710,037
REMOVABLE MAGNETIC HEAD ASSEMBLY WITH LIFTER FINGERS

George Adams, and John Hawkins, both of New York, N.Y., assignors to United Research Laboratory, New York, N.Y.

Filed Feb. 4, 1971, Ser. No. 112,626

Int. Cl. G11b *5/50, 5/56*

U.S. Cl. 179—100.2 R **9 Claims**



A tape deck is provided with a detachable magnetic head assembly including a group of tape lifter fingers mounted on the assembly and detachable from the deck with the assembly. The fingers are pivotable on a pivot and one of the fingers has a fork extending therefrom which is engaged by the pin of a rotary solenoid which supplies the force by which the fingers are pivoted. The fingers are mounted between magnetic heads and serve to lift magnetic tape from these heads.

3,710,038
MAGNETIC HEAD WITH TAPE CONTACTING GUARD SURFACE AND POLE TIPS OF SIMILAR FERRITE MATERIALS

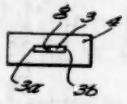
Yoshio Sakai, Yokohama; Zenkichi Nakamura, Miyagi-gun; Katsumasa Takahashi, and Naotoshi Sasada, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 768,324, Oct. 17, 1968, Pat. No. 3,598,925. This application Feb. 25, 1971, Ser. No. 118,659

Claims priority, application Japan, Oct. 18, 1967, 42/67040

Int. Cl. G11b *5/22, 5/14, 5/40*

U.S. Cl. 179—100.2 C **1 Claim**



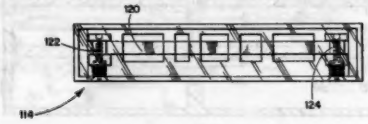
A magnetic head for video tape recorders having adjacent its ferrite pole tips a guard member of a similar ferrite material providing a tape contact surface having a hardness substantially equal to or a little less than that of the pole tips over the operating temperature range, but which guard material is substantially non-magnetic under working conditions. It is preferred to have the physical properties of the material of the guard member such as friction factor, coefficient of thermal expansion and the like similar to those of the pole tip material.

3,710,039

METHODS AND APPARATUS FOR ADJUSTING TAPE WITHIN A CARTRIDGE TO MINIMIZE DIFFERENTIAL PHASE SHIFT IN MULTIPLE CHANNEL TAPE RECORDING AND REPRODUCTION

William G. McFadden, Annisquam, Mass., assignor to Marathon Broadcast Equipment Sales Corp., Danvers, Mass.

Filed Nov. 24, 1970, Ser. No. 92,481
Int. Cl. G11b *23/04, 15/60*
U.S. Cl. 179—100.2 Z 15 Claims



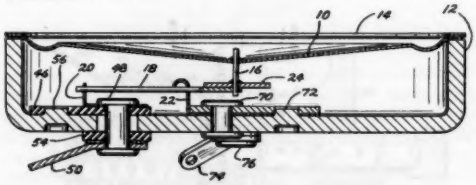
This disclosure depicts methods and apparatus especially useful for minimizing differential phase shift in the recording and reproduction of plural phase-related signals stored as multiple tracks on magnetic tape. Particular emphasis is placed upon applications in the field of broadcast stereophony. There is disclosed, inter alia, a number of tape magazine embodiments each comprising a casing, tape supply and take-up means providing an accessible loop of the tape, and guide means for accurately guiding the loop of tape through at least one transduction station at which magnetic signals may be applied to or derived from the tape. In each embodiment the tape guidance system is adjustable in azimuth to effect the said minimization of differential phase shift during recording and/or reproduction. In one magazine embodiment disclosed the tape guidance system is adjustable to compensate for errors in track height.

3,710,040

MICROPHONE HAVING IMPROVED PIEZOELECTRIC TRANSDUCER SUPPORTS

Frank Swinehart, Waseca, Minn., assignor to E. F. Johnson Company, Waseca, Minn.

Filed Sept. 3, 1970, Ser. No. 69,286
Int. Cl. H04r *17/02*
U.S. Cl. 179—110 A 10 Claims



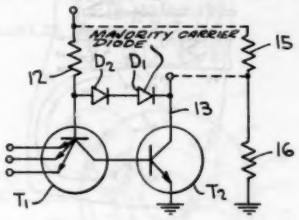
A microphone assembly in which a piezoelectric transducer beam is attached at one end to a flexible diaphragm and is supported at the other end by simply resting upon an electrical contact without being connected thereto. The transducer beam is pressed against the supporting contact by a second electrical contact that is shaped to support the transducer beam near its center and to apply a rotary force thereto. The second electrical contact has a rectangular opening formed in an end portion thereof for receiving and supporting the transducer beam and the end portion of the electrical contact beyond the rectangular opening is rolled over to form a spring for applying rotary force to the transducer beam.

3,710,041

ELEMENT WITH TURN-ON DELAY AND A FAST RECOVERY FOR A HIGH SPEED INTEGRATED CIRCUIT

Yutaka Hayashi, and Yasuo Tarui, both of Tokyo, Japan, assignors to Kogyo Gijutsuin, (a/k/a Agency of Industrial Science and Technology, Ministry of International Trade and Industry, Japanese Government, Tokyo-to, Japan

Division of Ser. No. 809,654, March 24, 1969, abandoned. This application March 18, 1971, Ser. No. 125,788
Claims priority, application Japan, March 25, 1968, 43/18984; April 21, 1968, 43/23973
Int. Cl. H03k *3/33, 5/08*
U.S. Cl. 307—300 2 Claims



A fast recovery delay element of an integrated circuit comprising a series connection of a "majority carrier diode" and at least one PN junction diode of conventional construction, said element being simple in structure and having a high utility in a high speed switching circuit of high efficiency.

ERRATUM

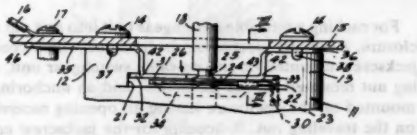
For Class 179—15 BY see:
Patent No. 3,710,056

3,710,042

ROTARY SWITCH WITH RETAINING CLIP FOR GROUNDING SHAFT TO CHASSIS TERMINAL

James D. Edwards, Russiaville, and Max R. McQuinn, Kokomo, both of Ind., assignors to The Scott & Fetzer Company, Kokomo, Ind.

Filed June 28, 1971, Ser. No. 157,230
Int. Cl. H01h *3/32, 9/12*; H02b *1/08*
U.S. Cl. 200—17 R 10 Claims

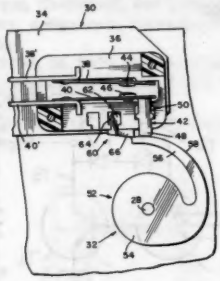


A rotary switch has a shaft that can be manually rotated and reciprocated. A detent structure normally holds the shaft in a selected axial position. The detent mechanism includes a retaining clip having lugs that can be manually bent to lock components in assembled relation, and a resilient clip ensuring continuous electrical continuity between the control shaft and the mounting means whereby the control shaft is grounded.

3,710,043
CAM OPERATED PERIODIC SWITCH WITH DEFLECTABLE KINETIC ENERGY STORAGE CAM OPERATOR AND ATTACHED MICROSWITCH RAMP

Wallace L. Linn, and Elmo W. Voland, both of Indianapolis, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed July 20, 1971, Ser. No. 164,385
Int. Cl. H01h 19/62, 5/14
U.S. Cl. 200—31 R 5 Claims

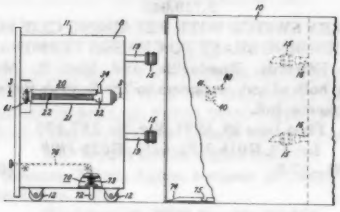


Electrical contacts carried by cooperating switch blades intermittently engaged one another in response to intermittent release of energy generated by rotating resilient means, the resilient means being rotated at a constant speed.

3,710,044
JACKSCREW TYPE OF RACKING MECHANISM FOR A MOVABLE SWITCHGEAR UNIT

William T. Sharp, Philadelphia, Pa., assignor to General Electric Company

Filed Dec. 23, 1971, Ser. No. 211,394
Int. Cl. H01h 9/20, 33/46
U.S. Cl. 200—50 AA 12 Claims

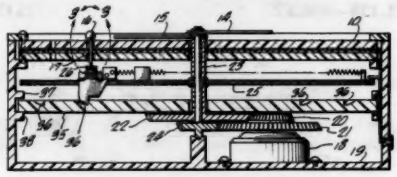


For racking a movable switchgear unit into and out of its enclosure, a racking mechanism is disclosed which comprises a jackscrew mounted on the movable switchgear unit, a traveling nut mounted on the jackscrew, and an anchoring device mounted on the enclosure having an opening receiving a lug on the traveling nut. A housing for the jackscrew contains a first slot extending axially of the jackscrew for holding the lug in said opening in the anchoring device during racking movement. The jackscrew housing also contains a second slot perpendicular to the first slot into which said lug can be moved when the nut is being uncoupled from the anchoring device. Friction means causes the nut to rotate with the jackscrew when the nut is properly positioned for uncoupling from the anchoring device, thereby causing jackscrew-rotation under these conditions to move the lug from the opening in the anchoring device into said second slot.

3,710,045
MULTIPLE CONTACT PROGRAM TIMER WITH ADJUSTABLE CONDUCTIVE BRUSH MEANS AND RESETTABLE CONDUCTIVE PINS

La Vergne C. Jochim, Buena Park, Calif., assignor to Ti-Mind Incorporated, Buena Park, Calif.

Filed Dec. 9, 1970, Ser. No. 96,334
Int. Cl. H01h 43/18
U.S. Cl. 200—37 R 13 Claims

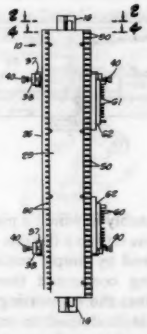


A resettable scheduling device is disclosed which will close an electrical contact at a predetermined time dependent upon the placement of one or more pins in a series of openings in the face plate of the device. When a pin is placed through an opening, it forms an electrical contact with an underlying layer of conductive metal mesh, screening or foil. A second contact point is moved to complete an electrical circuit through the pin in a timed manner. This contact may be completed by moving a conductive brush below an opening containing a pin. Another method of completing the circuit through the pin utilizes two insulated layers of conductive material. In one configuration, the upper face of the device has the indicia of a clock face with openings concentrically located at half-hour intervals. Means for moving the conductive brush with respect to the face plate are disclosed. These means include the rotation of the brush over a grooved disc together with a method for returning the brush to its starting point. In one example a brush is mounted in a slot of a metal coated plastic disc.

3,710,046
GANG CONNECTOR ASSEMBLY FOR TELEPHONE CABLE TERMINAL BOARD

Karl R. Anderson, Pasadena, Calif., assignor to John T. Thompson, Los Angeles and George W. Gillemont, Santa Monica, Calif.

Filed Nov. 18, 1971, Ser. No. 199,941
Int. Cl. H01h 13/70
U.S. Cl. 200—51 R 9 Claims



A gang connector assembly readily telescoped over the front of a telephone cable terminal board to make a separate connection to each terminal strip of the board. For this purpose the connector has a separate, resilient, conductive strip positioned to have multi-pronged wiping contact with each

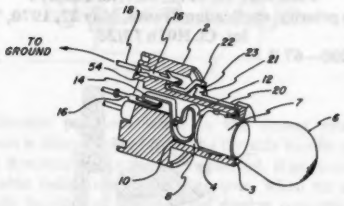
wire terminal strip carried by a terminal board. Additionally the connector is equipped with one or more pairs of manually adjustable clamps engageable with the opposite sides of a terminal board structure to clamp it in its installed position and readily released when the servicing operation has been completed.

3,710,047

SAFE DISCONNECT ELECTRIC SOCKET

Stephen Joseph Brzozowski, Detroit, and Melvin William Polkinghorn, Livonia, both of Mich., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 10, 1971, Ser. No. 151,779
Int. Cl. H01r 33/30
U.S. Cl. 200—51.1 **6 Claims**



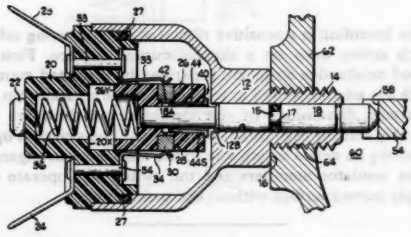
A safety feature in the form of a disconnect element for an electric socket structure is disclosed. The socket structure is formed of plastic material which is shaped to lock into openings provided to support and locate electric lights in automotive vehicles or the like. A separate ground element is employed with each socket to enable completion of an electric circuit. The safety feature forms a part of the ground element and automatically disconnects the ground element from the source of power in the event a lamp socket falls from, or is removed from, its respective opening.

3,710,048

MOTOR VEHICLE PLUNGER TYPE SWITCH UNIT WITH SELF-ADJUSTING SHAFT COUPLING CONNECTION

Cecil W. Schumacher, Letchworth, England, assignor to Borg-Warner Limited, Letchworth, England

Filed June 28, 1971, Ser. No. 157,523
Claims priority, application Great Britain, Sept. 24, 1970, 45,634/70
Int. Cl. H01h 3/14, 3/38
U.S. Cl. 200—52 R **11 Claims**



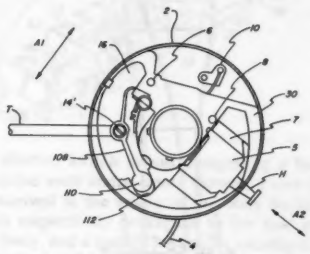
A self-adjusting start inhibitor switch unit for installation on motor vehicles equipped with transmissions is disclosed. The switch unit alternatively allows for actuation of the vehicle's engine starting circuit or completes the circuit to light the vehicle's reverse lamps or does neither depending upon the axial displacement of a spool which is moved by a plunger which rides on a cam surface that responds to the transmission shift lever setting. A locking washer connection between the plunger and spool allows the plunger to automatically and inverse-telescopically adjust to the correct arrangement as the switch unit is attached to the transmission housing or other seating and thus allows for a greater range of tolerances in the switch unit's housing, the transmission housing and the use of less labor in affixing the switch unit.

3,710,049

SWITCHES FOR TURN SIGNAL AND HAZARD WARNING LIGHTS

James P. Burgess, Brighton; Melvin W. Polkinghorn, Livonia, and Gunther Dieterle, Rochester, all of Mich., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 28, 1971, Ser. No. 147,751
Int. Cl. H01h 3/16
U.S. Cl. 200—61.27 **20 Claims**



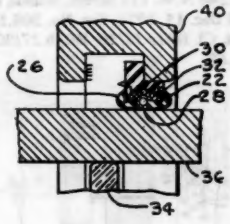
Switches are disclosed for controlling turn signal and hazard warning lights in automotive vehicles. The switches are concentrated in a small space in the steering column. Use is made of movable contact carriers in association with rotatable ball and leaf spring contacts to enable establishment of a number of different circuits. Elements are provided to enable lane change indications to be signalled without latching the switch and permitting cancellation of the lane change signal simply by release of the turn signal lever. Automatic return to neutral is provided for latched turn indications. A separate hazard warning control enables hazard warning signals through common switching elements regardless of the condition of the turn signal circuits.

3,710,050

ELECTRONIC PRESSURE SENSITIVE SWITCH

Arthur J. Richards, 4240 Yorkshire Road, Detroit, Mich.

Filed Sept. 14, 1970, Ser. No. 72,031
Int. Cl. H01h 3/16
U.S. Cl. 200—61.43 **8 Claims**



A pressure sensitive electronic switching device comprised of a flexible tubular member having a pair of electrical conductors spaced apart in the tube. The conductors are connected at one end to an electric circuit having a source of electrical power. A powdered semi conducting material occupies the space in the tube between the conductors. When a force is applied against the tube moving one conductor toward the other the powdered material is compressed. Before being

compressed the material has a high resistance to the flow of electric current between the conductors. As the material is compressed the resistance to the flow of current decreases. When the current flow reaches a predetermined value a relay or other current sensitive device in the electric circuit connected to the conductors is actuated.

3,710,051

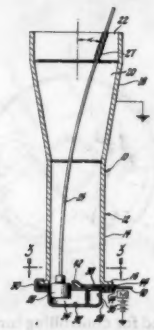
ACCELERATION RESPONSIVE SENSOR

Vincent A. Orlando, Greendale, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed July 23, 1971, Ser. No. 165,533

Int. Cl. H01h *35/02*

U.S. Cl. 200—61.45 R **4 Claims**



A sensor includes an elongated housing having a sector shaped recess defined by angularly diverging walls. One end portion of a spring member of predetermined elastic characteristics is secured to the housing to locate the undeflected axis of the member at an angle to an axis of the housing. The undeflected axis of the spring member intersects the plane of the recess to the proximal side of the recess. The other end of the spring member mounts a cylindrical mass engaging the walls of the recess adjacent their proximal ends to bow the unsecured portion of the spring member and create a preload force on the mass. An electrical contact finger is located at the distal end of the recess. When the mass receives an acceleration pulse of predetermined amplitude and time, the preload force is overcome and the mass moves into wiping engagement with the contact finger to close a circuit across a source of power and a mechanism to be actuated.

3,710,052

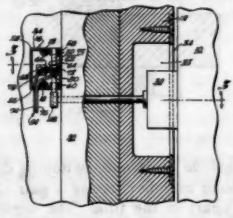
DOOR LATCH OPERATED SWITCH UNIT

Emile Jette, Jr., 1544 N.W. 111 Street, Miami, Fla.

Filed Dec. 15, 1971, Ser. No. 208,162

Int. Cl. H01r *33/30;* **H01h** *27/00*

U.S. Cl. 200—61.68 **7 Claims**



A door latch operated switch for energizing an electrical appliance, such as a lamp, in response to opening and closing a door, the switch being enclosed in an insulated housing which is fixed to the inside of the wall, adjacent to and somewhat above the position of the door latch when the door is closed. Leads are provided from the switch to a male plug to be connected in a wall outlet and plunger and lever means are utilized to open the switch when the door is closed and the door latch striker is in engagement with the plunger within the conventional latch recess in the door jamb. The male plug is provided with three terminals and a manually operated current flow control switch whereby a lamp, for instance, may be energized only when the door is opened or directly from the house current in a conventional manner.

3,710,053

QUICK-BREAK ELECTRIC SWITCH

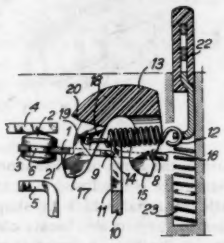
Rene Auchapt, Paris, and Gerard Michel Jullien, Bagnolet, both of France, assignors to L'Equipement General Electrique "Egelec,", Paris, France

Filed May 12, 1971, Ser. No. 142,674

Claims priority, application France, May 27, 1970, 7019335

Int. Cl. H01h *13/28*

U.S. Cl. 200—67 B **3 Claims**



A quick-break switch in which a contact-holder is associated to a movable weight pivotally connected to said contact-holder and adapted to strike the same in order to effect breaking responsively to the shifting of an actuating spring connected to said mass.

3,710,054

RIBBON SWITCH MEANS

Robert H. Koenig, Huntington Hills, N.Y., assignor to Tapeswitch Corporation of America, Farmingdale, N.Y.

Filed June 7, 1971, Ser. No. 150,505

Int. Cl. H01h *13/16*

U.S. Cl. 200—86 R **1 Claim**

The invention is a sensitive ribbon switch featuring reliable switch action even on a sharply curved surface. First and second conductive strips are separated by insulated members which are edge mounted in staggered space relationship. The transverse dimensions of the insulated members are considerably smaller than those of the strips. The switch is operative along its entire length due to the staggered arrangements of the insulator members and the switch will operate on a sharply curved surface without short-circuiting.

3,710,055

LOCOMOTIVE CONTROLLER WITH THROTTLE ESCAPEMENT

George W. Blonn, Sr., Downers Grove, Ill., assignor to General Motors Corporation, Detroit, Mich.

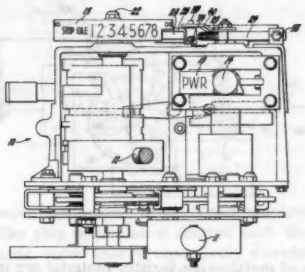
Filed June 15, 1971, Ser. No. 153,174

Int. Cl. H01h *7/10*

U.S. Cl. 200—153 R **7 Claims**

A locomotive controller in which a throttle handle assembly is selectively capable of operating as an engine power control

or as a dynamic brake control as controlled by the action of a selector lever. The mechanism incorporates detent means which are effective only during action of the throttle handle as an engine power control to position the handle in any selected one of the predetermined throttle positions. An escapement mechanism acts to prevent continuous power increasing movement of the throttle handle past at least the first and



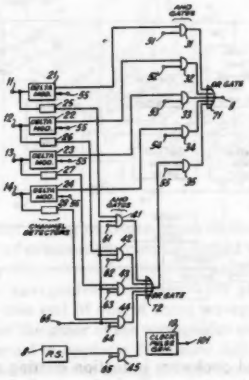
second throttle positions when in the power mode. The escapement is disconnected from the throttle handle assembly when the dynamic brake mode is selected, thus providing an unmistakable indication to the operator, when he advances the throttle handle, of whether the unit is operating in the power or dynamic brake mode without requiring his observation of the control panel.

3,710,056

TIME-DIVISION MULTIPLEX DELTA-MODULATION COMMUNICATION SYSTEM

Atsushi Tomozawa, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Continuation of Ser. No. 640,181, June 27, 1967, abandoned. This application May 21, 1970, Ser. No. 37,496
Claims priority, application Japan, May 25, 1966, 41/33381
Int. Cl. H04j 3/12
U.S. Cl. 179—15 BY **2 Claims**



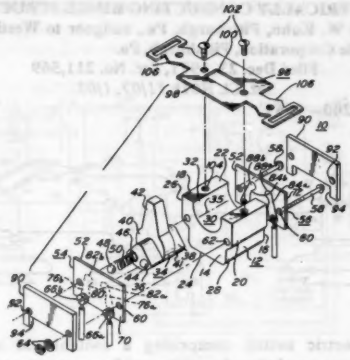
In a time-division multiplex delta-modulation communication system, a frame of the multiplexed signal is composed of a plurality of subframes larger in number than the multiplexed transmission channels by at least one and defined by control bits, one of which is allotted to frame synchronization and the remainder of which are allotted to channel monitoring and the like. A respective one of the control bits is transmitted every frame period while the respective channel information is transmitted every subframe period.

3,710,057

SILENT ELECTRIC SWITCH MEANS

Carl Carbonara, R.D. No. 4, P.O. Box 436, Uniontown, Pa.

Filed April 13, 1971, Ser. No. 133,506
Int. Cl. H01h 21/30, 23/12, 23/28
U.S. Cl. 200—164 R **10 Claims**



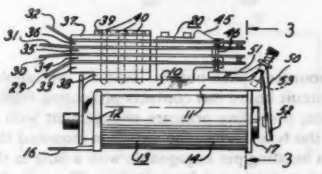
A silent electric switch means comprising a body having first and second ends and a cavity therein, a switch member rotatably received in the cavity of the body having first and second ends respectively proximate to the first and second ends of the body, and a control means for rotating the member between terminal and intermediate positions about a longitudinal axis. The first and second ends of the switch member are provided respectively with first and second electrical contact means with the first contact means electrically connected with the second contact means, first and second plates respectively mounted on the first and second ends of the body each having respective electrical contacts, the contacts of the first and second plates being respectively electrically engaged by the first and second contact means of the switch member when the switch means is in either of its terminal positions and disengaged when the switch means is in its intermediate position. A cylindrical surface of said cavity, having an arc of at least 180°, provides the only axis about which the switch member can pivot.

3,710,058

SWITCH ASSEMBLY HAVING WAFERS OF METAL OXIDE VARISTOR MATERIAL

John D. Harnden Jr., Schenectady, N.Y., assignor to General Electric Company

Filed Dec. 22, 1971, Ser. No. 210,998
Int. Cl. H01h 1/02
U.S. Cl. 200—166 C **6 Claims**



A plurality of elongated conductive contact element support members and a plurality of wafers of metal oxide varistor material are interleaved. Each of the wafers of metal oxide varistor material performs the dual function of insulating the adjacent conductive members contacting the opposed surfaces thereof as long as normal voltages appear across the members and of providing a progressively lower impedance between the conductive members when voltages across the

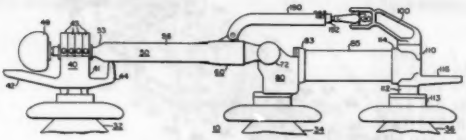
members tend progressively to exceed normal voltages thereby minimizing arcing across the contact elements when used in inductive circuits.

3,710,059

ELECTRIC SWITCH HAVING IMPROVED ELECTRICALLY CONDUCTING HINGE STRUCTURE

Edmond W. Kuhn, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1971, Ser. No. 211,569
Int. Cl. H01h *31/02, 1/02*
U.S. Cl. 200—166 C **7 Claims**



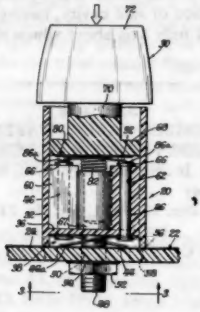
An electric switch comprising a switchblade movable between open and closed positions with respect to a relatively stationary contact means and supported by a hinged type conducting structure for rotational movement of the switchblade about its own longitudinal axis and pivotal movement about an axis generally perpendicular to the switchblade.

3,710,060

PUSH-BUTTON SWITCH FOR MOUNTING ON PRINTED CIRCUIT BOARD

Arnold Aage Brevick, Roselle, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed July 1, 1971, Ser. No. 158,691
Int. Cl. H01h *1/20*
U.S. Cl. 200—166 PC **12 Claims**



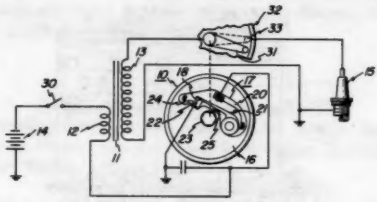
Stud-mounted push-button switch for application on printed circuit board has contacts projecting from its mounting surface, providing pressure engagement with conductive areas on the board when the switch is mounted thereon, and also has a locating pin engageable with a hole in the board to assure and maintain axial orientation. The movable member has a plate slidably received in the switch housing, and a plunger extending from the plate into a mating recess in the housing. A coil spring surrounds the plunger and serves the dual functions of biasing the movable member to retracted position, and of retaining in position against the plate a bridging contact member adapted to complete an electrical circuit between the first-mentioned contacts when the movable member is advanced to operative position by pressure on the push-button.

3,710,061

ELECTRICAL SWITCHES AND CIRCUITS THEREFOR

John D. Harnden, Jr., Schenectady, N.Y., assignor to General Electric Company

Filed Dec. 22, 1971, Ser. No. 211,008
Int. Cl. H01h *1/02*
U.S. Cl. 200—166 C **15 Claims**



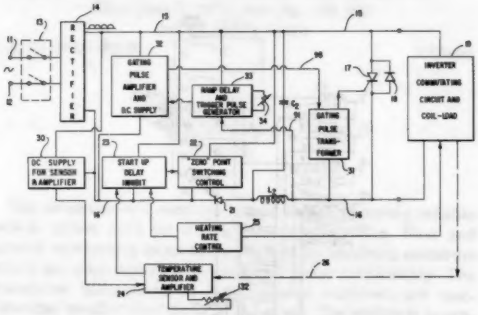
Elements of metal oxide varistor material are integrally incorporated into the assemblies of switches such as breaker point assemblies and electric door bell assemblies to provide the dual functions of insulating the contact element supporting parts thereof and for limiting the voltages developed across the contact elements thereby minimizing arcing across the contact elements and consequent erosion thereof and electromagnetic radiation produced thereby.

3,710,062

METAL BASE COOKWARE INDUCTION HEATING APPARATUS HAVING IMPROVED POWER SUPPLY AND GATING CONTROL CIRCUIT USING INFRA-RED TEMPERATURE SENSOR AND IMPROVED INDUCTION HEATING COIL ARRANGEMENT

Philip H. Peters, Jr., Greenwich, N.Y., assignor to Environment/One Corporation, Schenectady, N.Y.

Filed April 6, 1971, Ser. No. 131,648
Int. Cl. H05b *5/04*
U.S. Cl. 219—10.49 **44 Claims**


RECTIFIER
GATING PULSE AMPLIFIER AND DC SUPPLY
RAMP DELAY AND TRIGGER PULSE GENERATOR
GATING PULSE TRANSFORMER
INVERTER COMMUTATING CIRCUIT AND COIL-LOAD
DC SUPPLY FOR SENSOR & AMPLIFIER
START UP DELAY INHIBIT
"ZERO" POINT SWITCHING CONTROL
HEATING RATE CONTROL
TEMPERATURE SENSOR AND AMPLIFIER

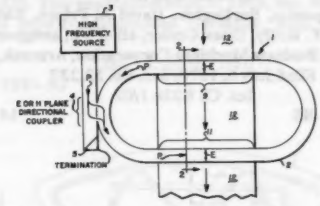
A metal based cookware induction heating apparatus having an improved power supply and control circuit comprised of a chopper inverter including a gate controlled power thyristor coupled to and supplying an induction heating coil with periodic energization currents. A full wave rectifier supplies rectified, unfiltered, unidirectional high voltage excitation potential to the chopper inverter which converts the excitation potential to a comparatively high frequency of the order of 20 kilohertz for supply to the induction heating coil. A gating circuit is provided for driving the chopper inverter directly from the rectified high voltage excitation potential supplied by the rectifier.

3,710,063

MICROWAVE APPLICATOR

Harry E. Aine, 2500 El Camino Real, Palo Alto, Calif.

Filed May 25, 1971, Ser. No. 146,731
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 9 Claims



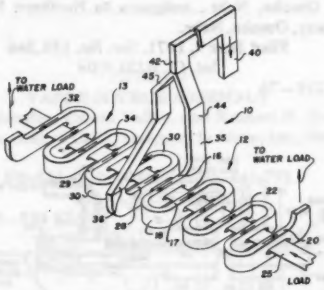
A microwave applicator is disclosed employing a ring resonator. The ring resonator is excited such that traveling electromagnetic wave energy repetitively circulates around the ring. The ring resonator is apertured for passage of material to be treated through the ring resonator for treatment by the traveling wave energy therein. In one embodiment the ring resonator is apertured in diametrically opposed regions of the closed loop such that a sheet of material to be treated is subjected to two treatments by the traveling wave energy in one passage through the resonator. In another embodiment, a nonreciprocal directional coupler is employed for exciting the traveling wave energy within the ring resonator.

3,710,064

MICROWAVE DRYING SYSTEM

Vishwa N. P. Mathur, Vancouver, B.C., Canada, assignor to MacMillan Bloedel Limited, Vancouver, British Columbia, Canada

Filed June 3, 1971, Ser. No. 149,448
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 6 Claims



Apparatus for drying moisture-laden dielectric material including a pair of substantially parallel slotted waveguides positioned side by side, material to be dried travelling through the slots of these waveguides, and microwave generating means connected to one end of one of these waveguides and to the opposite end of the other of the waveguides so that microwave energy is directed in opposite directions side by side through the material to effect even drying thereof across its width.

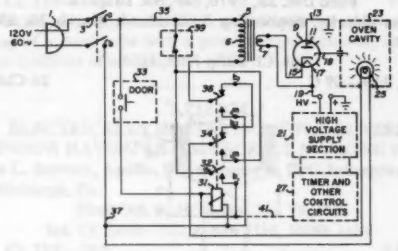
3,710,065

MAGNETRON POWER SUPPLY HAVING IN-RUSH CURRENT LIMITER

Paul Wythe Crapuchettes, Woodside, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.

Filed Dec. 6, 1971, Ser. No. 204,851
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 8 Claims

In a microwave oven which includes a cooking cavity, a magnetron for supplying microwave energy into the cooking cavity, a power supply of the type which supplies power to a magnetron and containing a filament transformer for stepping down line AC voltage to the lower voltage level for the magnetron heater, and an oven lamp for illuminating the oven cavity. The lamp normally is electrically in series with the primary winding of the filament transformer and current through the filament transformer is thereby limited resulting in minimal heater current to the magnetron heater. A relay or other controlling switch is energized by operation of an oven cavity door switch upon the first opening of the oven cavity door. The relay operates, interrupts the described series circuit, and places both the primary winding of the filament transformer and the lamp in parallel each across the AC supply lines so that full voltage is thereafter applied to both the lamp and filament transformer.

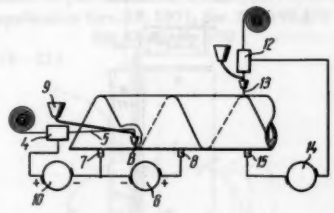


3,710,066

METHOD OF ELECTRIC-ARC WELDING OF TUBULAR PRODUCTS WITH MAGNETIC CONTROL OF THE ARC

Jury Isaakovich Raichuk, prospekt Gagarina, 88, kv. 33; Zakhar Osipovich Knyazhinsky, ulitsa Kirova, 8, kv. 4, both of Dnepropetrovsk; Simon Lvovich Mandelberg, bulvar Lesi Ukrainki. 2, kv. 55; Vladimir Konstantinovich Lebedev, ulitsa Engelsa, 25, kv. 12, both of Kiev, and Viktor Nikolaevich Volkov, prospekt K. Marxa, 52, kv. 43, Dnepropetrovsk, all of U.S.S.R.

Filed June 28, 1971, Ser. No. 157,260
Int. Cl. B23k 31/06
U.S. Cl. 219—61 3 Claims



A method for the electric-arc welding of tubular products, in which a magnetic field is made to act upon the arc so as to control the process of welding, the method characterized in that the magnetic field is established in the welding zone by passing an electric current along the workpiece from a separate current source.

3,710,067

METHOD AND APPARATUS FOR WIDENING THE FIELD OF APPLICATION OF ELECTRO-EROSION MACHINING AMD IMPROVING THE CONDITIONS ARISING IN THE WORK GAP

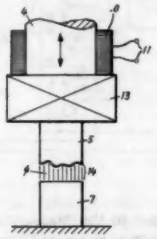
Werner Ullmann, Locarno; Renato Derighetti, Muralto; Costantino Tadini, Locarno; Roberto Farinelli, Losone, and Silvano Mettei, Solduno, all of Switzerland, assignors to A. F. fur Industrielle Elektronik Agie, Losone be Locarno, Losone, Switzerland

Filed Dec. 28, 1970, Ser. No. 101,718

Claims priority, application Switzerland, March 26, 1970, 4653/70

Int. Cl. B23p *1/08, 1/14*

U.S. Cl. 219—69 C 26 Claims



There is disclosed a method and apparatus for widening the field of application of electro-erosion machining techniques and for improving the conditions which arise in the work gap, this work gap being constituted by at least one tool electrode and at least one workpiece electrode and contains a liquid and/or gaseous medium. At least one generator is provided for delivering an operating voltage to the work gap. According to an important aspect of the present invention, a magnetic field is superimposed at the work gap upon the operating voltage, the magnetic lines of force of which magnetic field are situated essentially perpendicular to the erosion front.

3,710,068

PREHEATING OF WELDING SLAG FOR BETTER STARTING

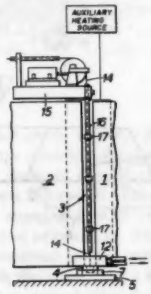
Ernest Calton, and Arthur Spencer, both of Sheffield, England, assignors to British Steel Corportion, London, England

Filed Jan. 20, 1971, Ser. No. 107,958

Claims priority, application Great Britain, Feb. 3, 1970, 5,118/70

Int. Cl. B23k *9/18*

U.S. Cl. 219—73 8 Claims



A method of producing an electroslag welded bond between spaced metal bodies. In particular a trough is located beneath the bodies so as to bridge the whole length of the gap between them and slag in either a molten or a dry powdered state is placed in the trough and pre-heated by a source (e.g., an induction coil) operative to produce uniform heat transfer along the whole length of the gap to facilitate the start of welding.

3,710,069

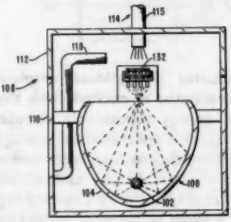
METHOD OF AND APPARATUS FOR SELECTIVE SOLDER REFLOW

John Papadopoulos, Burlington; David A. Prince, Richmond, and Roger F. Reilly, Essex Center, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 6, 1970, Ser. No. 52,237

Int. Cl. B23k *1/02*

U.S. Cl. 219—85 14 Claims



A method of selective solder reflow in which an article to be reflowed is heated for a period of time sufficient to melt the solder, and at least one solder deposit which is not to be reflowed is cooled to prevent that solder from melting. In order to reduce temperature gradients in the article, the cooling is delayed until the heating has been applied.

3,710,070

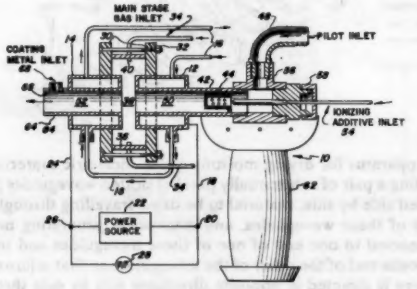
LOW VOLTAGE, COMPACT ELECTRICALLY AUGMENTED BURNER

Thomas J. Hirt; Richard D. Kissinger, and Karl H. Frantzen, all of Omaha, Nebr., assignors to Northern Natural Gas Company, Omaha, Nebr.

Filed June 9, 1971, Ser. No. 151,266

Int. Cl. B23k *9/04*

U.S. Cl. 219—76 7 Claims



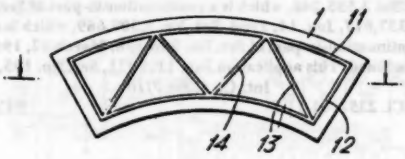
A compact, low voltage burner capable of supplying high gas temperatures by electrical augmentation provided by a diffuse discharge in the gas stream at substantially less than 1,000 operating volts, including two electrodes spacially separated by less than 2 inches, a pilot stage for supplying a conductive zone between the electrodes, a gas inlet to supply the main gas to be heated to the conductive zone, means for supplying RF energy to said electrodes, and means for supplying an operating voltage of substantially less than 1,000 volts to start and maintain a diffuse discharge in the burner.

3,710,071

METHOD FOR PRODUCING FRICTION DISCS

Ulrich Volker, Sophienstr. 9c, 2057 Reinbek; Heinz Fabian, Willinghusener Weg 43, 2056 Glinde, and Klaus Mertl, Ostlandring 44, 2057 Reinbek, all of Germany

Division of Ser. No. 662,707, Aug. 23, 1967, Pat. No. 3,485,331. This application Sept. 4, 1969, Ser. No. 855,114
Claims priority, application Germany, Aug. 26, 1966, J 31642
Int. Cl. B23k *11/10*
U.S. Cl. 219—93 3 Claims



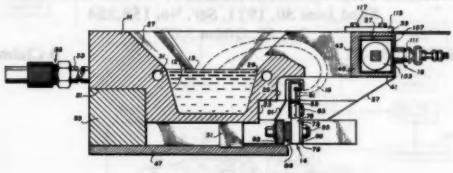
A method for producing friction discs in which a sintered friction lining member is electric resistance welded to a hardened sheet metal support. The lining member is press molded in a recessed mold cavity so as to form on the friction lining member projections corresponding to the recesses. The projections are of less density than the rest of the molded body. Preferably the recesses and projections are bead-like and disposed in lines. The friction lining member is then electric resistance welded to the hardened sheet metal support with pressure so that the projections are flattened and brought back to the same density as the remainder of the friction lining member.

3,710,072

VAPOR SOURCE ASSEMBLY

Robert L. Shrader, Castro Valley, and Kazumi N. Tsujimoto, El Cerrito, both of Calif., assignors to Airco, Inc., New York, N.Y.

Filed May 10, 1971, Ser. No. 141,791
Int. Cl. B23k *15/00*
U.S. Cl. 219—121 EB 8 Claims



A vapor source assembly is described in which an electron beam is deflected in an arcuate path by a main magnetic field from an electron beam gun positioned below the level of the crucible to impinge upon the top surface of material in the crucible. A second magnetic field is produced within the first magnetic field and has lines of force of variable orientation to provide a controllable variation in beam deflection so that the beam may be swept upon the surface of the material contained in the crucible.

3,710,073

WELDING WIRE

Igor Konstantinovich Pokhodnya; Valery Nikolaevich Shlepakov, and Vladimir Fedorovich Alter, all of Kiev, U.S.S.R., assignors to Institut Electrosvarki Imeni E. O. Patena Akademie Nauk UKR SSR, Kiev, U.S.S.R.

Filed Feb. 12, 1970, Ser. No. 11,006
Claims priority, application U.S.S.R., Feb. 25, 1969, 1305592
Int. Cl. B23k *35/24*
U.S. Cl. 219—146 1 Claim

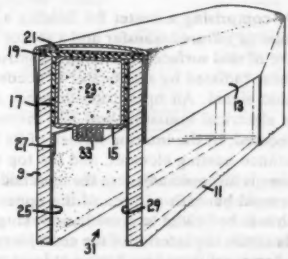
Welding wire for steel welding and built-up welding, consisting of a steel tube with a powder core including a vapor-phase inhibitor of corrosion.

3,710,074

ELECTRICALLY HEATED MULTIPLE GLAZED WINDOW HAVING AN IRIDESCENCE MASKING FILM

John L. Stewart, Apollo, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 8, 1970, Ser. No. 79,076
Int. Cl. E06b *7/12*; G02b *5/26*; H05b *3/26*
U.S. Cl. 219—203 6 Claims



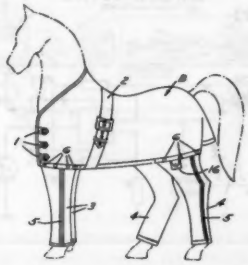
A multiple glazed window unit having an electro-conductive coating and bus bars on the enclosed space surface of one of its glass panels is used to reduce condensation, drafts, and room heat loss adjacent to the window when the outside temperature is below that inside. A selective reflecting film on the enclosed space surface of one of the panels improves the heat insulating character of the unit and reduces visible iridescence common to electroconductive films. The selective reflecting film has an absolute infrared reflectance of at least 0.7 and sufficient visible light reflectance for the substantial elimination of visible iridescence.

3,710,075

THERAPEUTIC LEGGING

Virginia M. Jablonowski, 260 Rowe Road, Milford, Mich.

Continuation-in-part of Ser. No. 53,208, July 8, 1970. This application Nov. 18, 1971, Ser. No. 199,876
Int. Cl. H05b *1/00*
U.S. Cl. 219—211 1 Claim



A therapeutic legging for bovine, equine or like animals, comprising an electrically heated sleevelike covering con-

toured to fit the leg of an animal. The sleevelike covering may be battery operated or it may be plugged into a standard alternating current outlet. An adjustable control regulates the amount of electrical energy delivered to the heating element for the covering, and means are provided for preventing excessive heating to protect the animal and also the materials of the covering.

3,710,076

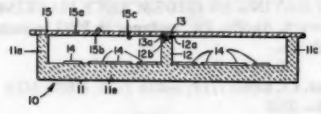
RADIANT SURFACE-HEATER AND TEMPERATURE SENSING ASSEMBLY

John F. Frazier, 9 Fox Lane, Painted Post, N.Y.

Filed Feb. 17, 1972, Ser. No. 227,079

Int. Cl. H05b *3/68*

U.S. Cl. 219—449 **15 Claims**



An assembly comprising a heater for heating a surface by thermal radiation or infrared transfer and a sensor for sensing the temperature of said surface to provide a control signal for adjusting the heat radiated by said heater in accordance with the valve of said signal. An open top container or box-like member of an electrical insulating and low thermal transfer material has secured, to the interior surface of its bottom, an electrical resistance heating element, and the top of the container or member is disposed adjacent the underside of a plate or vitreous material beneath an area of the upper surface of the plate which is to be heated to provide a cooking surface. A divider extends across the interior of the container or box-like member and a temperature sensor having at least one flat side is supported in a channel provided in the upper surface of the divider with the flat side of the sensor in firm physical contact with the underside of the plate in the region of the cooking surface. The sensor is shielded to a substantial degree by the divider but a selected amount of the sensor is left exposed to heat radiated by the heating element to prevent "overshoot" when the assembly is used in an electrical circuit system for controlling the temperature of the cooking surface.

3,710,077

HEATER-TIMING APPARATUS

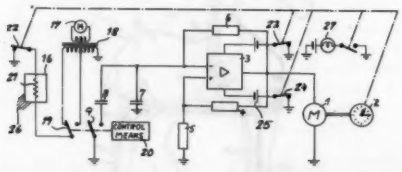
Helmut Hubert, Erda; Anton L. Jung, Herborn; Manfred Lapczyna, Wetzlar; Erhard Ledwon, Guntersdorf; Wilfried Rock, Herborn, and Gerhard Schmidt-Burbach, Wetzlar, all of Germany, assignors to Buderus' Sche Eisenwerke, Wetzlar, Germany

Filed May 10, 1971, Ser. No. 141,718

Claims priority, application Germany, May 12, 1970, P 20 22 963.4

Int. Cl. H05b *1/02*

U.S. Cl. 219—492 **8 Claims**



An oven in an aircraft has a heater operable at a relatively high and a relatively low heating level. A timer which serves to turn off the heater can also operate at a rate corresponding to real time and at a slower rate. When the oven is operated at its low level the timer is operated at its slower rate. In this manner the timer will turn off the oven after a predetermined amount of heating, even if the oven energy consumption is reduced for a part of the cooling or thawing period. The timer has a synchronous motor driven by an oscillator whose output frequency is a function of the operating level of the heater.

3,710,078

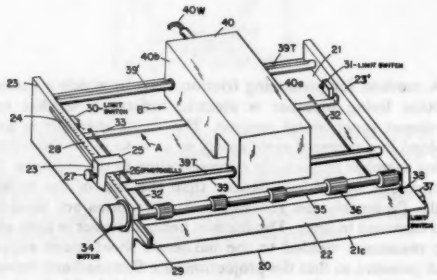
DOCUMENT SCANNING APPARATUS AND METHOD

Jerome H. Lemelson, 85 Rector Street, Metuchen, N.J.

Continuation-in-part of Ser. No. 622,650, March 13, 1967, Pat. No. 3,555,246, which is a continuation-in-part of Ser. No. 337,617, Jan. 14, 1964, Pat. No. 3,309,669, which is a continuation-in-part of Ser. No. 806,398, March 12, 1969, abandoned. This application Jan. 11, 1971, Ser. No. 105,236

Int. Cl. G06r *7/10*

U.S. Cl. 235—61.11 E **9 Claims**



A scanning apparatus for reading and generating electrical signals of recordings provided on a sheet containing parallel lines or tracks of said recordings. The scanning transducer is operable to be moved in a plurality of directions with respect to a document which is driven to preposition it with respect to the transducer. Control of the operation of the transducer is effected by scanning marks or signals recorded on the document, generating electrical signals upon detecting such recordings and thereafter initiating or terminating the scanning function which is preceded by the termination or initiation of the operation of the card driving means.

3,710,079

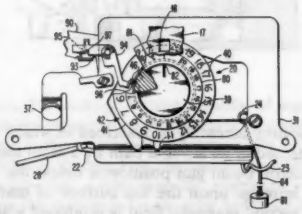
COPY MACHINE WITH PREDETERMINED COUNTER

Walter O. Cralle, Jr., Georgetown, and Kenneth A. Lennon, Frankfort, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,354

Int. Cl. G06m *3/02*

U.S. Cl. 235—91 R **6 Claims**



A mechanical predetermined counter for a copy machine is provided with a non-resetting input control that continuously displays the number of copies to be made of an original in a

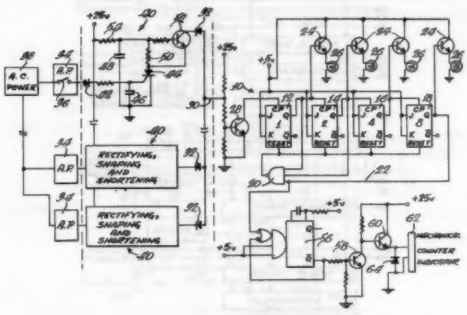
repetitive sequence. An incrementing mechanical display shows the number of copies already produced in the sequence. Upon completion of the predetermined number of copies, the machine automatically terminates the sequence and is automatically restored to a ready condition to receive a new original document for copying.

3,710,080

BOWLING GAME COUNTER

Claude E. Ellis, c/o Brunswick Corporation, 525 West Laketon Avenue, Muskegon, Mich.

Filed July 20, 1970, Ser. No. 56,612
Int. Cl. A63d 5/04
U.S. Cl. 235—92 GA **1 Claim**



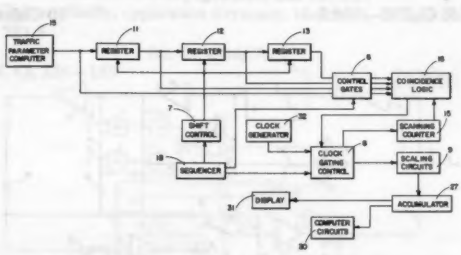
An apparatus for counting and indicating the number of bowling games played in a bowling establishment having a plurality of lanes, each equipped with an automatic pinsetter. A count by eleven feedback counter provides a single output signal in response to 11 frame input signals each of which may be taken from the various automatic pinsetters each time a frame is played on any one of the lanes to convert frame signals to game signals. The output signal from the counter is then fed to a totalizer indicator which indicates the number of output pulses received as indicative of the number of games played in the bowling establishment.

3,710,081

SYSTEM FOR COMPUTING THE AVERAGE OF SUCCESSIVE TRAFFIC MEASUREMENTS

Peter F. Apitz, Fullerton, Calif., assignor to Tamar Electronics, Inc., Anaheim, Calif.

Filed June 14, 1971, Ser. No. 152,789
Int. Cl. G06f 15/48
U.S. Cl. 235—150.24 **9 Claims**



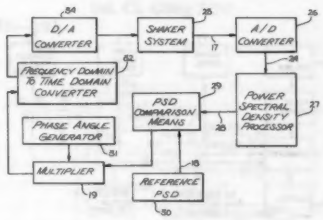
Successive samplings of digital signals representing traffic measurements are fed to a first digital register, the signals in this first register being shifted into second and third registers as each successive sampling is received. The input signals as they appear and the signals in each register are sequentially scanned with a scanning counter to produce a pulse output in accordance with the numerical value of the signal at the input and that of each of the registers. These signals are appropriately scaled by a factor in accordance with the number of samplings taken to produce a signal in accordance with an average of these samplings, this pulse count being accumulated in an accumulator. The signal in the accumulator, which represents the average of each last group of successive samplings evaluated, is continually updated to include each newly arriving input sampling, with the oldest sampling being dropped from the computation. The signal in the accumulator is fed to computer circuits or to a display for appropriate utilization.

3,710,082

SYSTEM FOR DIGITALLY CONTROLLING A VIBRATION TESTING ENVIRONMENT OR APPARATUS

Edwin A. Sloane, and Charles L. Heizman, both of Los Altos, Calif., assignors to Time/Data Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 23,556, March 3, 1970, abandoned. This application July 22, 1971, Ser. No. 165,176
Int. Cl. G01n 29/00; G06f 15/34
U.S. Cl. 235—151 **30 Claims**



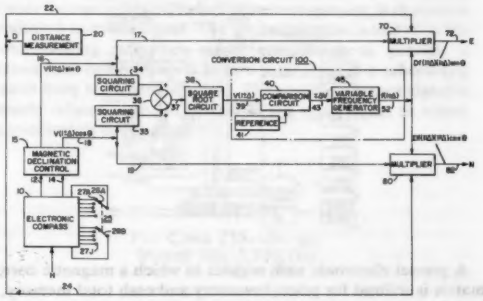
A system for controlling a vibration testing environment or apparatus such as a shaker table with a random signal in order to subject a specimen on the table to vibrations having a predetermined power spectral density is disclosed. The movement of the specimen is sensed and converted into a digital signal representative of the power spectral density of the movement. This digital signal is compared with the predetermined or desired spectral density and the results of the comparison are utilized with a digitally generated random phase angle to produce a random digital signal. This random digital signal is converted to a time-domain, analog driving signal for driving the apparatus. The same system may be used for high intensity sound testing and sine wave testing.

3,710,083

NORMALIZATION CIRCUIT FOR POSITION LOCATOR

Wallace J. Hoff, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 11, 1971, Ser. No. 114,524
Int. Cl. G01c 17/38; G06g 7/78
U.S. Cl. 235—151.3 **12 Claims**



Apparatus, carried by a person who is walking, for measuring distance traversed and direction of travel. Direction of

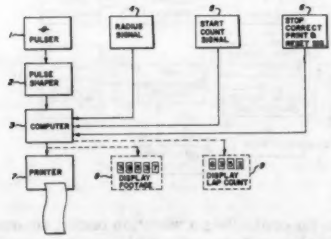
travel is determined by an electronic compass which generates voltages which are proportional to the horizontal component of the Earth's magnetic field. These voltages control the output frequency of a voltage controlled oscillator (VCO). Because the output frequency of the VCO responds to the component voltages, it also changes in response to variations in the Earth's magnetic field, and the output of the VCO is multiplied with the output voltage from the distance measuring circuit and with the output voltages from the electronic compass in order to reduce the effects of the changes in the Earth's magnetic field.

3,710,084

NON-CONTACT STRIP COIL LINEAR FOOTAGE MEASURING APPARATUS AND METHOD

William E. Slagley, Columbus, Ohio; Gerald R. Seifert, Calumet City, and Edmund J. Valonis, Homewood, both of Ill., assignors to Inland Steel Company, Chicago, Ill.

Filed April 29, 1971, Ser. No. 138,633
Int. Cl. G06f 15/46
U.S. Cl. 235—151.32 **12 Claims**



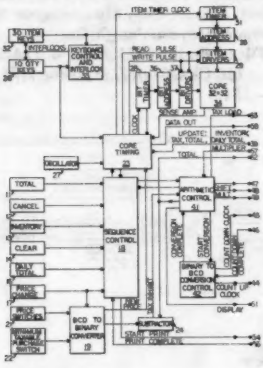
Method and apparatus for very accurately determining the length of strip coils, such as hot or cold rolled steel strip, without contacting the strip.

3,710,085

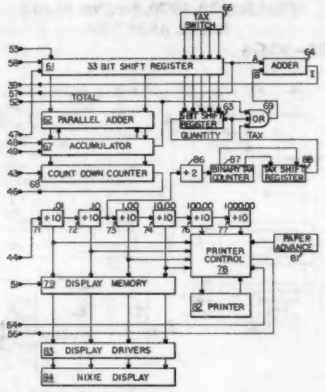
PRE-SET ELECTRONIC CASH REGISTER

Donald R. Brewer, and Richard A. Schipper, both of San Diego, Calif., assignors to Tele Cash, Inc., San Diego, Calif.

Filed Oct. 26, 1970, Ser. No. 83,790
Int. Cl. G06f 7/52
U.S. Cl. 235—164 **6 Claims**



A pre-set electronic cash register in which a magnetic core matrix is utilized for price, inventory and cash total memory, and for temporary storage of quantity, tax and total for individual transactions. Each item for sale in a given transaction is represented by a separate item key which, together with a quantity key, has an input to the core memory. The price for each individual item is stored in the corresponding item in memory. This is addressed with an item key and a quantity key for each transaction and read out into a shift register through suitable core timing circuitry. The shift register is parallely connected to an accumulator which, when the item priced and quantity or multiplier has been shifted out of the shift register, contains the product. The tax rate is accomplished through a binary number representing the tax rate times 200 which is multiplied by the total and divided by 200 after which it is added to the sum of the product's item and quantity. An updated inventory is coupled back to the core memory system after each transaction. When the transaction is completed, printer-control circuitry activates a printer which itemizes the transaction and prints out the tax and total. Inventory keys are provided for printing out the existing inventory stored in the memory core. Suitable circuitry is provided for changing item prices and tax rates. The minimum tax rate is programmed through a BCD to binary converter into a subtractor for comparing an individual transaction with a minimal tax rate and inhibits the tax circuitry when the transaction is below the minimum taxable purchase.

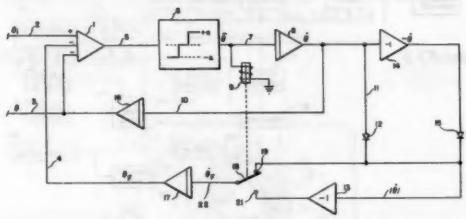


3,710,086

SERVO SYSTEM EMPLOYING SWITCHING TYPE FEEDBACK

Reinhard N. Lahde, Los Altos, and Alex Pawelek, Granada Hills, both of Calif., assignors to Lockheed Aircraft Corporation, Los Angeles, Calif.

Filed Feb. 5, 1970, Ser. No. 8,934
Int. Cl. G06g 7/70
U.S. Cl. 235—150.2 **10 Claims**



The invention provides a servo control system, capable of either a continuous or discontinuous operating mode, which utilizes sign-switched integration circuit to obtain extremely fast response under an unusually wide r..nge of operating conditions. Two internal feedback quantities are employed, one of which comprises the output control signal and the other of which is the output of an integrator whose input is connected

to a circuit element which generates a positive or negative value of the first time derivative of the output control signal and whereby the sign of this first time derivative is made dependent upon variables of the system. The application of the invention to a spacecraft navigation system is described.

3,710,087

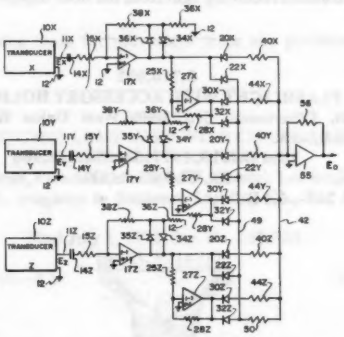
CALCULATION OF APPROXIMATE MAGNITUDE OF A PHYSICAL VECTOR QUANTITY

Vernon H. Siegel, c/o Kistler Instrument Corporation 8989 Sheridan Drive, Clarence, N.Y.

Filed March 24, 1971, Ser. No. 127,577

Int. Cl. G06g 7/22

U.S. Cl. 235—189 **16 Claims**



A method and apparatus for calculating the approximate magnitude of a vector resultant physical quantity, such as acceleration, pressure, or force, from its orthogonal component quantities eliminates the necessity for squaring or square root computations. Three electrical component representations, as from transducers oriented along three orthogonal axes, are summed together and added to the largest magnitude one of the electrical representations to produce a resultant which approximately equals the magnitude of the resultant vector in space. In a preferred embodiment, the summed representations are multiplied by a scale factor of 0.58 before being added to the largest magnitude representation.

3,710,088

PLANAR VECTOR ANALYZER

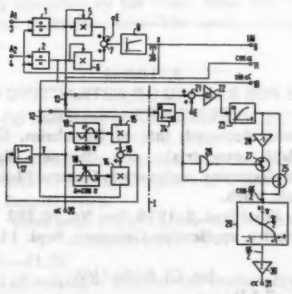
Felix Blaschke, Erlangen, and Klaus Haken, Furth, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed March 17, 1971, Ser. No. 125,131

Claims priority, application Germany, March 18, 1970, P 20 12 781.5

Int. Cl. G06g 7/22

U.S. Cl. 235—189 **7 Claims**



Analyzing apparatus for determining characteristic magnitudes of a planar vector with the aid of two dividers, each of which has a pair of inputs. One of each pair receives a voltage proportional to one of the two orthogonal vector components respectively. The output voltages of the two dividers are added, and the sum is compared with a constant voltage in the input circuitry of a regulator, preferably an integral regulator, whose output voltage is applied to the other two inputs of the respective quotient forming members. The respective outputs of the two dividers are connected to trigonometric-function generating circuitry of electronic computer type which has an output voltage indicative of the phase angle of the vector.

3,710,089

HIGHLY PRECISE AND STABLE LOGARITHMIC CIRCUIT

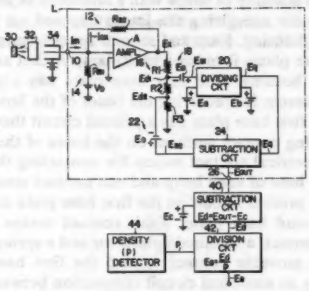
Shuichi Ohata; Yoji Takeuchi, and Takeshi Ishiguro, all of Tokyo, Japan, assignors to Yokogawa Electric Words Ltd., Tokyo

Filed Dec. 20, 1971, Ser. No. 209,651

Claims priority, application Japan, Dec. 29, 1970, 45/128618

Int. Cl. G06g 7/24

U.S. Cl. 235—193 **9 Claims**



A logarithmic circuit of a highly precise and stable type useful in absorption metering apparatus where the range of input signals is narrow. The circuit receives an input signal which has the form of a product of an input reference signal and an exponential signal. The circuit, by means of a feedback operational amplifier, provides a difference signal proportional to the difference between the input signal and the input reference signal. The difference signal thereby includes its own reference signal component corresponding proportionally to said input reference signal. By means of a resistive voltage divider circuit, the difference signal is split into first portion equal to a constant a times the difference signal and a second portion equal to $(1 - a)$ times the difference signal, and a is selected to be approximately $1/\sqrt{2}$. The first portion is added to the corresponding reference signal component to form a sum signal by which another signal, equal to the square of the corresponding reference signal component, is divided to produce a quotient signal. The second portion is added to the corresponding reference signal component to provide a second sum signal which is in turn subtracted in a subtracting circuit from the quotient signal. The resulting output signal is linearly related to the logarithm of the input signal to within approximately 0.1 percent.

ERRATUM

For Class 235—54 see:
Patent No. 3,710,105

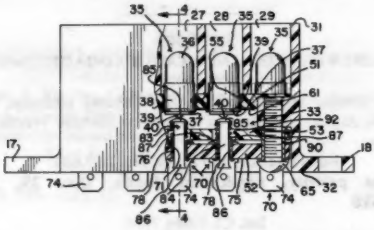
ERRATA

For Classes 235—54 F and 235—201 see:
Patents Nos. 3,710,105 and 3,710,123

3,710,090
MULTI-LAMP ASSEMBLY

Gerald J. Shea, Buffalo Grove, and David R. Marach, Schaumburg, both of Ill., assignors to Underwriters Safety Device Co., Chicago, Ill.

Filed Jan. 11, 1971, Ser. No. 105,572
Int. Cl. F21v 29/00; F21g 3/00
U.S. Cl. 240—2 R 17 Claims

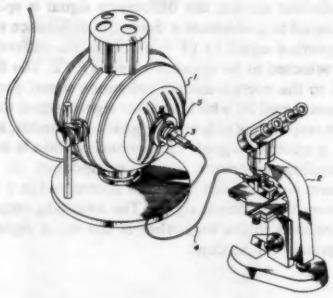


The multi-lamp assembly includes a compact housing for mounting a plurality of lamps with a minimum of lead terminal connectors for energizing the lamps exposed on the bottom side of the housing. First and second spaced apart, generally parallel base plates forming a multi-lamp socket are mounted within the housing. The first base plate has a plurality of openings therein for receiving the bases of the lamps and one face of the first base plate has a printed circuit thereon for interconnecting contact surfaces on the bases of the lamps. Individual electrical contact means for contacting the end contact on the base of each lamp and one contact means for contacting the printed circuit on the first base plate are mounted on the second base plate. Each contact means includes a movable contact, a terminal connector and a spring means for urging the movable contact toward the first base plate for establishing an electrical circuit connection between the contact means and a lamp end contact or the printed circuit.

3,710,091
FIBER OPTIC ILLUMINATOR APPARATUS FOR SCIENTIFIC INSTRUMENTS

John M. Holcomb, 6649 Sesame Lane, Tucson, Ariz.

Filed Jan. 27, 1971, Ser. No. 110,121
Int. Cl. G02b 21/06
U.S. Cl. 240—2 MA 2 Claims

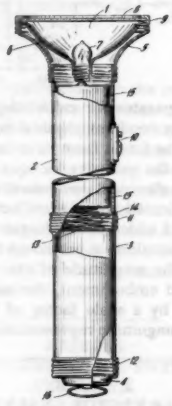


In order to selectively illuminate scientific instruments, such as the field of view of a high grade microscope, with light having predetermined characteristics, an adapter is provided for coupling a conventional lamphouse to a fiber optic bundle which terminates, at it remote end, at the area to be illuminated. The adapter is provided with fittings to mate with lamphouse and contains a collector lens or lens group to concentrate and collimate light from the lamphouse onto the transmitting end of the fiber bundle. The adapter is generally cylindrical in shape and, intermediate along its length, a circumferential segment is cut away to receive one or more filters to condition the light issued from the lamphouse according to the illumination requirements. The characteristics of the light transmitted through the fiber bundle may further be controlled by selecting the lamp utilized in the lamphouse. In variant configurations, the adapter incorporates a right angle prism at its outer end to permit the fiber bundle to be directed radially outwardly from the adapter to minimize the extent of the adapter from the lamphouse, which extent may be a critical factor where the lamphouse is installed permanently near a wall or other object with which the adapter might otherwise physically interfere. A conventional shutter mechanism is incorporated into another variant of the adapter for providing the capability of controlled transient illumination to the scientific instrument receiving light from the fiber bundle.

3,710,092
FLASHLIGHT WITH ACCESSORY HOLDER

John H. Olbermann, Jr., 2650 West Union Hills Drive, Phoenix, Ariz.

Filed Oct. 13, 1971, Ser. No. 188,966
Int. Cl. F01v 33/00
U.S. Cl. 240—6.4 R 3 Claims



A multi-section flashlight with an auxiliary compartment which screws onto the battery holder provides space for service, first aid or survival items or the like making a unitary flashlight and aid or survival kit. The rear threads of the battery holder are identical to rear threads on the auxiliary compartment so that an end cap can be alternatively screwed onto the battery holder and compartment.

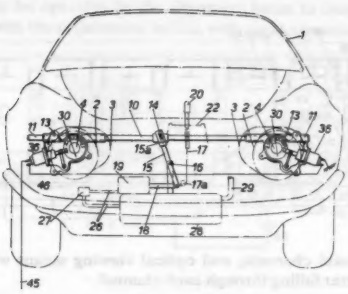
3,710,093
DEVICE FOR RAISING OR RETRACTING MOTOR VEHICLE HEADLAMPS

Wilhelm Riehl, deceased, late of Raunheim, Germany (by Paula Riehl, executrix), and Werner Karl Strobel, Wiesbaden, Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 8, 1970, Ser. No. 70,202
Claims priority, application Germany, Sept. 11, 1969, P 19 46 010.7
Int. Cl. B60q 1/06
U.S. Cl. 240—7.1 H 1 Claim

The invention relates to raising and retracting motor vehicle headlamps and includes an electrically operated spring biased

interlock device for holding the headlamps raised or retracted



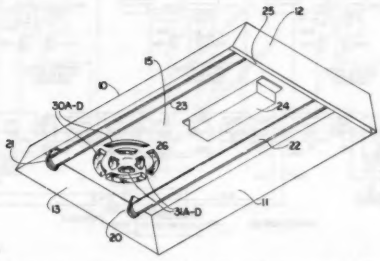
and releasing them for movement from one position to the other.

3,710,094

FLUORESCENT LUMINAIRE WITH CIRCULAR HEAT-EXCHANGE LOUVER

Ernest Monte, Pasadena, and Syed H. Quadri, Los Angles, both of Calif., assignors to Sunbeam Lighting Co., Los Angeles, Calif.

Filed July 1, 1971, Ser. No. 158,803
Int. Cl. F21s *3/02*
U.S. Cl. 240—9 A **8 Claims**



A luminaire containing one or more fluorescent tubes is provided with a housing in the form of a closed-end trough having a generally planar back surface with one or more ventilating air exhaust louvers therethrough. A light-transmitting front surface is provided with apertures therethrough for the passage of ventilating air into the luminaire, each louver in the back surface being comprised of a plurality of concentric rings of apertures, each aperture being provided with a superimposed vane disposed at an angle with respect to the plane of the louver, whereby the louver openings are substantially obscured by the vanes from a viewing angle near normal to the plane of the louver and the majority of the louver openings are substantially obscured by the vanes from any viewing angle from the front of the luminaire. The apertures are either arcuate or linear.

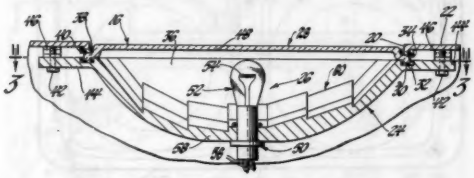
3,710,095

METHOD OF MAKING A FACETED REFLECTOR FOR A LIGHTING UNIT

Robert J. Donohue, Birmingham, and Bernard W. Joseph, Berkley, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 23, 1970, Ser. No. 74,562
Int. Cl. F21v *7/09*
U.S. Cl. 240—41.36 **3 Claims**

A method of making a reflector for predictably projecting a light beam from a light source by individually orienting a plurality of discrete reflecting facets with respect to the source such that the superposition of the reflected images synthesizes a predetermined lighting distribution. By selecting the number, size, curvature, and location according to the techniques disclosed herein, the prescription for the reflector



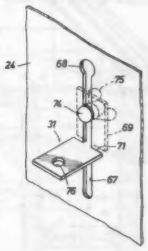
produces the desired illumination distribution within prescribed limits. By positioning contiguous facets such that uncontrolled reflectors are shaded from the light source, glare from the lighting unit is substantially eliminated.

3,710,096

ADJUSTABLE SUPPORT FOR LIGHT FIXTURES

Ralph M. McFarlin, Pasadena, Tex., assignor to Esquire, Inc., New York, N.Y.

Division of Ser. No. 26,705, April 8, 1970, Pat. No. 3,652,847.
This application Dec. 7, 1971, Ser. No. 205,579
Int. Cl. F21v *21/14*
U.S. Cl. 240—67 **1 Claim**



A substantially L-shaped supporting member 31 is mounted in a slot 67 in a light fixture. Both legs are wider than the slot. Recess 71 which forms a web to connect the legs is slightly wider than the thickness of the fixture wall. The web is narrower than the slot. The support can be rotated 90° when the nut 74 is withdrawn from hole 68 at the end of the slot.

3,710,097

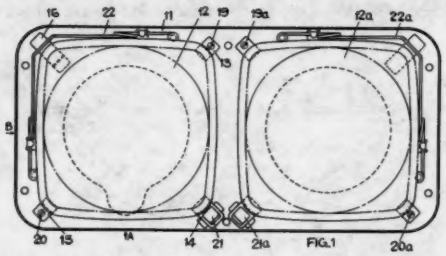
HEADLAMP ASSEMBLIES

Peter Frederick Bright, Moseley, and Michael John Germany, Lichfield, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Jan. 15, 1971, Ser. No. 106,857
Claims priority, application Great Britain, Jan. 23, 1970, 3,297/70; Sept. 18, 1970, 44,603/70
Int. Cl. F21v *7/00*
U.S. Cl. 240—41.6 **6 Claims**

A headlamp assembly for a road vehicle includes a mounting panel which is arranged to be secured to the body of the vehicle. A lamp unit is secured to the mounting panel by first and second screws and the arrangement is such that rotation of the screws serves to adjust the position of the lamp unit relative to the panel. The first and second screws are positioned on a diameter of the lamp unit on opposite sides of the lamp unit, the diameter being arranged at approximately 45° to the vertical in use. A support member interconnects the lamp unit and the panel and is spaced by approximately 90°

around the peripheral of the lamp unit from the first and second screws. A spring acts between the corner of the lamp



unit opposite the support member and the panel, to urge the lamp unit towards the panel.

3,710,098

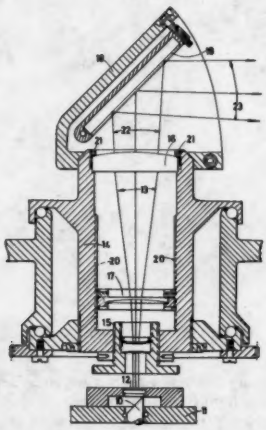
NAVIGATION LIGHTS

Noel Harry Fred Walden, Queensland, Australia, assignor to Laser Electronics Pty. Ltd., Queensland, Australia

Filed May 24, 1971, Ser. No. 146,222

Int. Cl. F21g *3/02*

U.S. Cl. 240—49 **4 Claims**



A swept-beam visual light assembly includes a laser light source, a beam collimator, and beam-sweeping means in which the beam width and rate of sweep are such as to give a light flash of duration more than 100 microseconds and beam power at maximum range not less than 4×10^{-9} watts per square centimeter. The laser is preferably stationary and the collimator and beam-sweeping means rotate together.

3,710,099

OPTICAL UNIT FOR USE IN A LIGHT-SENSITIVE SORTING MACHINE

Thomas Henry Chapman, Sanderstead, England, assignor to Gunson's Sortex Limited, London, England

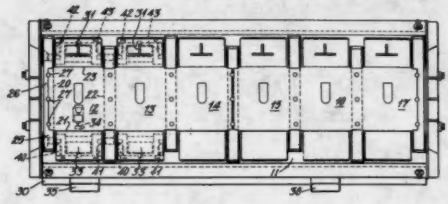
Filed Jan. 4, 1971, Ser. No. 103,445

Claims priority, application Great Britain, Jan. 5, 1970, 398/70

Int. Cl. B07c *5/342*; G06m *7/00*; H01j *39/12*

U.S. Cl. 240—51.11 R **10 Claims**

An optical unit for use in a light-sensitive sorting machine comprising a chamber having a plurality of adjacent vertically extending channels therethrough through which may fall matter to be sorted, a plurality of fluorescent light-producing means for directing visible light onto matter falling through the channels, at least one of the fluorescent light-producing means being arranged to direct the visible light into a plurality



of the said channels, and optical viewing means which view the matter falling through each channel.

3,710,100

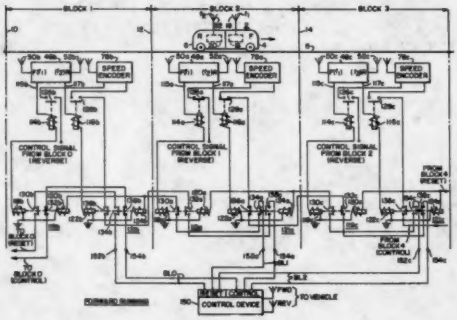
VEHICLE MOVEMENT CONTROL AND DETECTION METHOD AND APPARATUS

Robert H. Perry, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 24, 1970, Ser. No. 101,333

Int. Cl. B611 *21/10*

U.S. Cl. 246—28 R **10 Claims**



A vehicle movement control and detection system is divided into a plurality of vehicle control blocks, and the movement of a vehicle within a given vehicle control block is controlled by a vehicle control signal generated in the given vehicle control block. A signal receiver in the given vehicle control block senses the presence of a vehicle and a storage device stores a vehicle presence signal in response to the signal receiver sensing the vehicle presence. The storage device continues to store the vehicle presence signal until the vehicle has checked into the following vehicle control block. The generation of the vehicle control signal is prevented in the event the signal receiver no longer senses the vehicle's presence, or the storage device no longer stores the vehicle presence signal, during the time the vehicle is within the given vehicle control block, or in the event another vehicle is present in the succeeding vehicle control block.

3,710,101

APPARATUS AND METHOD FOR ALIGNMENT OF MEMBERS TO ELECTRON BEAMS

Terence W. O'Keeffe, and Paul R. Malmberg, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

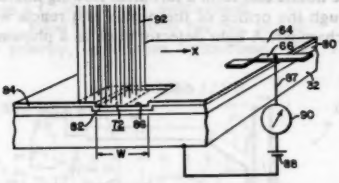
Filed Oct. 6, 1970, Ser. No. 78,505

Int. Cl. H01j *37/00*

U.S. Cl. 250—49.5 T **10 Claims**

Apparatus for exposing precisely located areas of a member to an electron beam wherein the member is precisely located by means of registration indicia thereon which cooperate with

an alignment beam of electrons. Suitable control means are provided to be operated by the alignment beam to cause it to coincide with the registration indicia with great precision. The



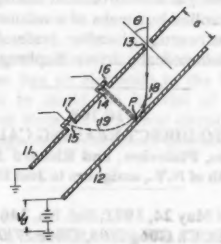
method enables repeated aligning of selected areas of members exactly to a patterned electron beam within a fraction of a micron.

3,710,102

ENERGY ANALYZER OF PARALLEL PLANE TYPE

Takashi Nagatani, Katsuta, Japan, assignor to Hitachi Ltd., Tokyo, Japan

Filed Oct. 1, 1971, Ser. No. 185,743
Claims priority, application Japan, Oct. 5, 1970, 45/86640
Int. Cl. H01j *39/34*
U.S. Cl. 250—49.5 AE **1 Claim**



In an energy analyzer of parallel plane type used for determining the energy composition of a group of electrified particles which have passed a sample membrane and a part of which have been enervated or retarded, the analyzer comprising two planar electrodes disposed parallel with a space therebetween, a voltage being applied between said electrodes so as to deflect paths of the particles depending on the velocities thereof and to thereby separate the particles according to the magnitude of energy; an improvement for rendering the separation of particles virtually more complete by measuring secondary electrons emitted from one of the electrodes bombarded by particles having larger energy instead of measuring such particles per se.

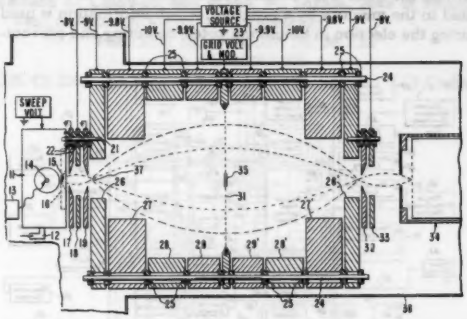
3,710,103

PLANAR RETARDING GRID ELECTRON SPECTROMETER

John C. Helmer, Menlo Park, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Dec. 3, 1971, Ser. No. 204,459
Int. Cl. G01t *1/36*
U.S. Cl. 250—49.5 AE **22 Claims**

A retarding grid form of electron spectrometer utilizing a single grid structure, the retarding grid being planar and being positioned in a focusing structure that first defocuses the beam of electrons and then refocuses it onto an electron detector, the retarding grid being located in the focusing structure near the point of maximum diameter of the electron beam. The focusing structure produces very strong accelerating and decelerating fields near its beam entrance and exit regions, respectively, such that the retarding and accelerating fields at



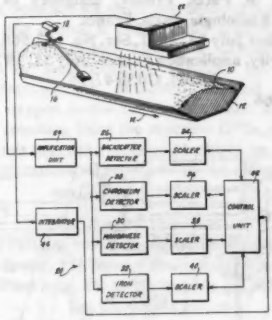
the retarding grid are very weak, resulting in sharp lines in the electron spectrum.

3,710,104

METHOD AND APPARATUS FOR X-RAY INTERROGATION OF A SAMPLE

William R. Pavlik, Parma, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Nov. 4, 1969, Ser. No. 873,781
Int. Cl. G01n *23/20*
U.S. Cl. 250—51.5 **8 Claims**



A system for and method of analyzing material by X-ray radiation techniques. Material under inspection is irradiated by primary X-rays; fluorescent X-rays emitted by the material are analyzed to determine the constituency of the material. Backscattered primary X-ray radiation is detected to determine the amount of material present to compensate for material loading. The primary X-ray radiation may include a component of the fluorescent X-ray radiation of an energy in the order of the energy of fluorescent X-ray emission in the sample so as to enhance fluorescent emission in the sample. The applied fluorescent X-ray radiation may be generated by a collimator used to house the primary source and which is stimulated by the source to fluoresce.

3,710,105

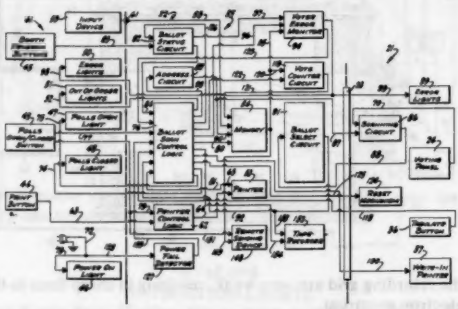
VOTING MACHINE AND METHOD

Joseph W. Oxendine, Jr., Walnut Creek; Gary J. Happs, Concord, and Dale A. Keltie, Hayward, all of Calif., assignors to Filper Corporation, San Ramon, Calif.

Filed April 1, 1970, Ser. No. 24,662
Int. Cl. G07c *13/00*
U.S. Cl. 235—54 F **14 Claims**

A programmable voting machine utilizing electronic data processing techniques has a plurality of voting booths

operated from a central control module containing a memory and control circuitry. Prior to each election, information concerning the form and content of the ballot to be used is supplied to the memory by a program, which information is used during the election in tabulating votes, detecting and prevent-



ing erroneous votes, and operating a write-in printer to receive write-in votes. The votes are totalized and stored in the memory as they are cast, but only at the conclusion of the election may the totalized votes be printed or conveyed to a central counting station.

3,710,106

X-RAY FILM HANDLING APPARATUS

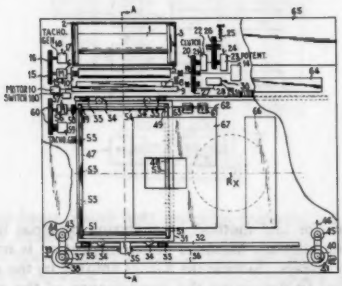
Rene Loucheur; Michel Hommerin, and Jean Claude Paul Louche, all of Paris, France, assignors to Compagnie Generale de Radiologie, Paris, France

Filed July 14, 1971, Ser. No. 162,568

Claims priority, application France, July 31, 1970, 7028428

Int. Cl. G03b *41/16*

U.S. Cl. 250—66 **8 Claims**



An X-ray apparatus for use with spool-mounted film enabling different film formats and different exposure patterns to be selected and comprising : a film supply section with a motor-driven feed roller and a film cutter assembly ; a film transfer section comprising two pairs motor-driven of belts located on a frame-shaped carriage mounted on rails for lateral displacements ; and a section for marking and storing the exposed film.

3,710,107

ATMOSPHERIC MONITOR BY MEANS OF CHEMILUMINESCENT REACTION

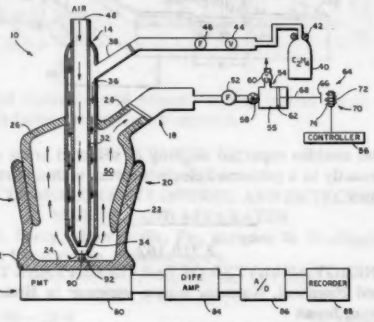
Gary J. Warren, Los Altos, and Gordon L. Babcock, Menlo Park, both of Calif., assignors to Radiation and Environmental Materials, Inc., Santa Monica, Calif.

Filed Jan. 25, 1971, Ser. No. 109,202

Int. Cl. G01n *31/00*

U.S. Cl. 250—71.5 R **12 Claims**

A continuous, gas phase chemiluminescent monitor is disclosed. Air is introduced into a reaction chamber through an elongated nozzle. A chemiluminescent reagent gas such as ethylene for detecting ozone or ozone for detecting nitrogen oxides is injected into an annular inlet surrounding the air nozzle. The gases mix within a mixing chamber at the end of the concentric nozzle and form a turbulent flowing mixture which exits through the orifice of the nozzle and reacts within the reaction chamber. A light detector such as a photomultiplier



tube is disposed adjacent the chamber and the chemiluminescent output of the reaction is detected and the signal is amplified and recorded, preferably as a digital readout. The flow rate of reagent gas is controlled at the inlet while the flow rate of air is controlled by means of a vacuum pump attached to the outlet of the reaction chamber, preferably by a pump incorporating an electronically driven diaphragm.

3,710,108

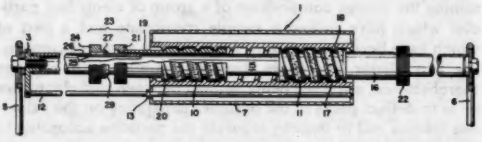
RELATING TO DIRECT READING CALCULATORS

John J. Haarhaus, Plainview, and Richard J. McEvilly, New Hyde Park, both of N.Y., assignors to Joel Halpern, a part interest

Filed May 24, 1971, Ser. No. 146,109

Int. Cl. G06g *1/08*; G06c *27/00*

U.S. Cl. 235—79 **12 Claims**



This invention relates to direct reading calculators and to same when incorporated as part of a shopping cart handle. Briefly, the calculator comprises a pair of rotatable cylindrical members each of which carries a logarithmic scale. Means are provided for indexing one of the cylindrical members to the other for simultaneous rotation. The scales are preferably calibrated respectively in price units and in weight and volume units.

3,710,109

PRECISION DOSIMETRY OF HIGH ENERGY RADIATION

Lyman Chalkley, 6626 Tyrian Street, La Jolla, Calif.

Filed May 27, 1970, Ser. No. 41,088

Int. Cl. G01t *1/04*

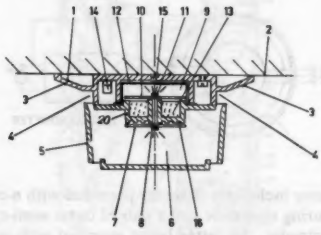
U.S. Cl. 250—83 CD **8 Claims**

In the use of dye cyanide solutions for the dosimetry of radiations with energies above 6.5 electron volts precision is attained by de-aeration of the dye cyanide solution and irradiation under conditions that exclude gaseous oxygen.

3,710,110
IONIZATION FIRE ALARM DEVICE WITH SHIELDING FOR ITS ELECTRICAL CIRCUITRY

Thomas Lampart, Mannedorf; Andreas Scheidweiler, and Max Kuhn, both of Stafa, all of Switzerland, assignors to Cerberus A G, Mannedorf, Switzerland

Filed May 14, 1970, Ser. No. 37,256
Claims priority, application Switzerland, May 19, 1969, 7606/69
Int. Cl. G08b 17/10
U.S. Cl. 250—83.6 FT 10 Claims

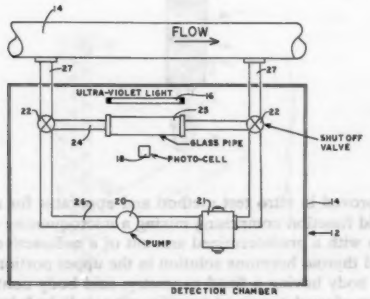


An ionization fire alarm which is of the type comprising a measuring or detecting ionization chamber electrically connected in series with a resistance element, preferably constructed as a reference ionization chamber, and wherein an electrode of the measuring ionization chamber is in the form of a plate arranged to shield the interior of the measuring ionization chamber from an electrical circuit to which such electrode is connected. According to further important aspects of the invention, the aforementioned reference ionization chamber also has an electrode in the form of a plate likewise arranged to shield the interior of such reference ionization chamber from the electrical circuit. The electrical circuit is advantageously positioned between the two plate electrodes.

3,710,111
DYNAMICALLY CALIBRATED OIL CONTENT METER

Lawrence Collura, Bethpage, N.Y., assignor to Edward Dreyfus, Clark and Lawrence Collura, Bethpage, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,860
Int. Cl. G01n 21/26
U.S. Cl. 250—83.3 UV 4 Claims

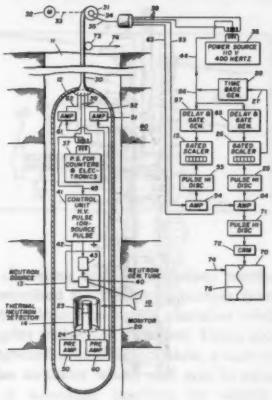


A system to continuously detect oil concentration levels in water flowing through a pipe having a transparent shunt path illuminated by an ultraviolet light source and a photo-cell detector responsive to light irradiation intensities therefrom. A second shunt path and small pump are provided about the first shunt path enabling the system to be zero balanced for ambient conditions of the principal liquid and alarm tripping calibrated under dynamic conditions for a predetermined concentration level therein.

3,710,112
METHOD OF INDIRECTLY MONITORING THE OUTPUT OF A PULSED NEUTRON SOURCE

Richard L. Caldwell, and Wyatt W. Givens, both of Dallas, Tex., assignors to Mobil Oil Corporation

Filed May 18, 1970, Ser. No. 38,226
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 R 3 Claims

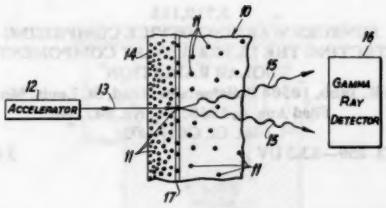


The specification discloses a borehole tool for assaying for uranium and having a pulsed neutron source of the accelerator type and a detector for detecting delayed fission neutrons. In operation, the source is periodically actuated to produce very short neutron bursts having a duration of a few microseconds or less. Located adjacent the source is a gamma-ray detector for detecting delayed gamma rays emitted from oxygen in the formations when irradiated with neutrons and resulting from the reaction $O^{16}(n,p)N^{16}\xrightarrow{\beta^-}O^{16}+\gamma$. These gamma rays are recorded to obtain an indirect measure of the neutron output produced by the source.

3,710,113
LITHIUM NUCLEAR MICROPROBE

Gerald M. Padawer, 275 Revere Road, Roslyn Heights, N.Y.

Filed Aug. 31, 1970, Ser. No. 68,365
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 R 3 Claims

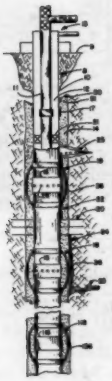


A beam of lithium ions (^7Li) is accelerated and bombarded against the surface of a target material containing hydrogen atoms at sufficient energy to stimulate an ^1H (^7Li, γ)^8Be radiative capture reaction and the intensity of the resulting emission of capture gamma rays is directly proportional to the number of hydrogen nuclei (protons) in the target material at a particular depth. The ^1H (^7Li, γ)^8Be reaction occurs only within a very narrow range of relative velocities between the lithium and hydrogen nuclei and, consequently, within a very narrow region inside the target material, permitting the concentration of hydrogen in solids to be measured at selected depths by varying the bombarding energy of the lithium ions.

3,710,114
METHOD AND APPARATUS FOR DETERMINING COMMUNICATION OF A PERFORATED ZONE WITH A SECOND ZONE

Roy R. Vann, 3302 Providence Drive, Midland, Tex.

Filed Jan. 25, 1971, Ser. No. 109,381
Int. Cl. G01v 5/00
U.S. Cl. 250—83.6 W 12 Claims



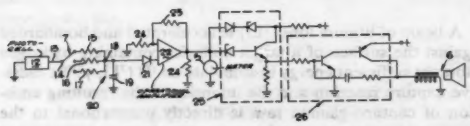
Method for locating the presence of passageways formed longitudinally of a borehole which communicates a production zone with a second zone, by placing isotopes adjacent the well casing at spaced apart locations above and below the perforated zone, and by placing spaced apart second isotopes adjacent the borehole annulus above and below the perforated zone of the borehole. The first spaced apart isotopes have a half life or decay rate substantially different from the second isotopes, and accordingly, translocation of either of the isotopes may be traced with radiation measuring apparatus.

The apparatus includes means for affixing one isotope adjacent the casing, and further includes means for holding the remaining isotope adjacent the borehole wall, so that each of the different isotopes are horizontally spaced apart by the cement which attaches the casing to the borehole wall.

3,710,115
SUNBURN WARNING DEVICE COMPRISING DETECTING THE ULTRA-VIOLET COMPONENT OF SOLAR RADIATION

James R. Jubb, 10304 Bellefontaine Road, St. Louis, Mo.

Filed Aug. 4, 1969, Ser. No. 847,348
Int. Cl. G01j 1/02
U.S. Cl. 250—83.3 UV 2 Claims

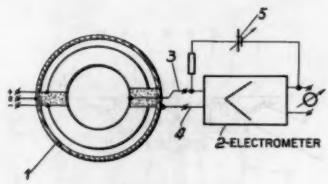


The present invention relates to a sunburn warning device comprising radiation detection means, integrator means, measurement means and indicating means to advise the user of the amount of radiation received related to the time of exposure.

3,710,116
DOSIMETER FOR PENETRATING IONIZING RADIATION OF ANY COMPOSITION AND SPECTRUM

Mieczyslaw Zielczynski, Nowatki 35 m 99, and Krzysztof Zarnowiecki, Stoleizna 2 m 99, both of Warszawa, Poland

Filed March 4, 1969, Ser. No. 804,146
Claims priority, application Poland, March 5, 1968, P 125,622
Int. Cl. G01t 1/02; H01j 39/28
U.S. Cl. 250—83.6 R 5 Claims

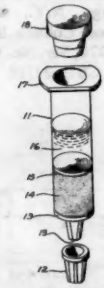


A dosimeter includes a detector provided with a cylindrical inner measuring electrode and a pair of outer semi-cylindrical voltage electrodes, the latter being supplied with voltages of opposite polarity to provide in the space between electrodes a differential chamber having a first saturated volume and a second volume for column recombination of ions, the two volumes overlapping: a recorder connected with the measuring electrode provides a measure of dose equivalent.

3,710,117
VITRO TEST SYSTEM FOR ASSESSING THYROID FUNCTION

Jack Gross and Amirav Gordon, both of Jerusalem, Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem

Filed April 27, 1970, Ser. No. 32,185
Int. Cl. G21h 5/00
U.S. Cl. 250—106 T 8 Claims



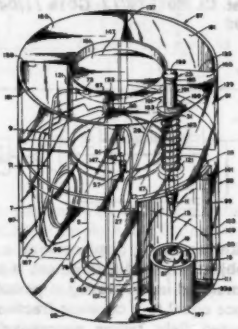
Improved in vitro test method and apparatus for assessing thyroid function comprising mixing a microquantity of blood serum with a predetermined amount of a radioactive isotope tagged thyroid hormone solution in the upper portion of a tubular body having a fixed geometry, said body containing a column of predetermined quantity of cross linked dextran gel as a secondary binding site in an aqueous fluid held between porous discs in the lower portion of the body and having valve means at the lower end thereof, allowing said mixture to enter said column, determining the total added thyroid hormone by a radioactivity measurement, washing or eluting said column with a suitable fluid, determining the amount of hormone retained in said column by a radioactivity measurement and making a calculation based on the ratio of the amount of retained hormone to the total amount of added hormone for the particular thyroid hormone being assessed.

3,710,118

RADIOISOTOPE GENERATOR

Richard L. Holgate, Creve Coeur, and James R. Montgomery, St. Louis County, both of Mo., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.

Filed May 25, 1970, Ser. No. 40,944
Int. Cl. G21h 5/00
U.S. Cl. 250—106 S 2 Claims



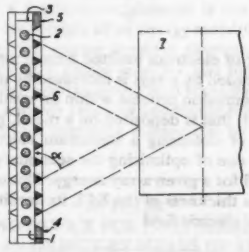
A generator is provided for eluting a daughter radioisotope from a parent radioisotope. The generator is characterized by an elongate closed vessel having a convergent closed lower end and containing therein a supply of a parent radioisotope material spaced from the closed lower end. The vessel is closed at its upper end with a closure through which extends a first conduit communicating with the upper end of the vessel for introducing an eluant into the vessel. Also extending through the closure is a second conduit communicating with the lower end of the vessel which provides for passage of eluate from the lower end of the vessel.

3,710,119

COLLIMATION DEVICE FOR IRRADIATION APPARATUS

Rene Eymery, Grenoble, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Oct. 8, 1969, Ser. No. 864,692
Claims priority, application France, Oct. 23, 1968, 68171099
Int. Cl. G21h 5/00
U.S. Cl. 250—106 S 8 Claims



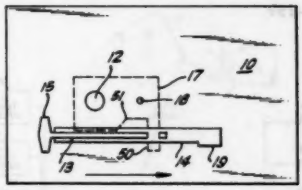
A collimation device for an irradiation apparatus comprising in particular a radioactive source having a generally flat shape constituted by a source-holder frame in which radioactive elements are disposed in spaced relation, characterized in that it comprises a mask having open portions which is placed in parallel relation in front of at least one face of said source and in proximity thereto, said mask being made up of a series of screens formed of absorbent material and adapted to project in the direction of packages to be irradiated which pass in front of said source, each screen having a transverse cross-section which decreases from said source towards said packages.

3,710,120

MANUALLY OPERATED SAMPLE CHANGING ELEVATOR AND LIGHT SEALING MECHANISM FOR SCINTILLATION COUNTERS AND THE LIKE

Dale D. Robinson, Placentia, Calif., assignor to Beckman Instruments, Inc.

Filed Oct. 28, 1970, Ser. No. 84,591
Int. Cl. G01t 1/20
U.S. Cl. 250—106 SC 10 Claims



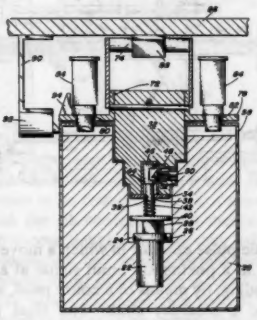
A sample changing and light sealing mechanism is illustrated and described for moving a sample from one vertical plane to another into a counting chamber while maintaining the light integrity within the chamber. Upon movement of the control arm toward a loading position, a cam on said control arm rotates an actuator wheel and arm to raise the elevator table from a counting position to within an elevator passageway and make a light tight seal at the chamber end of the passageway. The actuator wheel is stopped during further movement of the control arm which then opens an outer shutter over the passageway. The actuator wheel is then again rotated to raise the elevator still further so that the sample may be removed and replaced. Movement in the opposite direction reverses the sequence such that the chamber is at all times sealed against ambient light.

3,710,121

SHIPPING CONTAINER FOR RADIOACTIVE MATERIAL USING SAFETY CLOSURE DEVICES

Paul H. Bedrosian, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare

Filed Aug. 13, 1970, Ser. No. 63,492
Int. Cl. G21f 5/00
U.S. Cl. 250—108 R 8 Claims

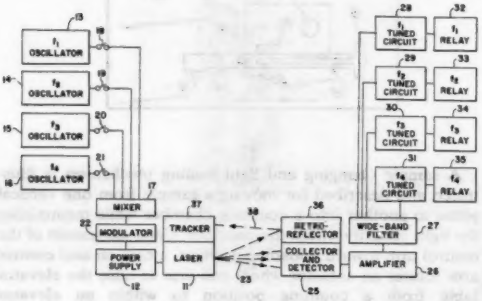


A shipping container for radioactive materials which not only adequately shields the material from endangering a person handling it, but also protects the material during shipment. A series of interrelated, coacting, components must be operated in a step-wise manner before the container can be properly and safely closed.

3,710,122
A LASER COMMUNICATION SYSTEM FOR CONTROLLING SEVERAL FUNCTIONS AT A LOCATION REMOTE TO THE LASER

Ernest E. Burcher, Newport News, Va.; Carroll W. Rowland, Hampton, Va., and Archibald R. Sinclair, Hampton, Va., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed April 24, 1970, Ser. No. 31,702
Int. Cl. H04b *9/00*; G02b *5/10*
U.S. Cl. 250—199 **4 Claims**

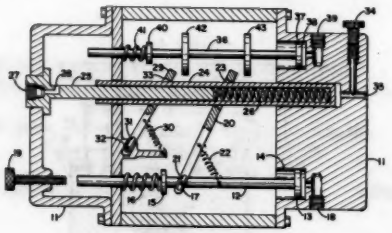


A multichannel laser remote control system for use in areas where radio frequency, acoustic and hardwire control systems are unsatisfactory or prohibited and where line-of-sight is unobstructed. A modulated continuous wave He-Ne laser is used as the transmitter and a unique 360° light collector serves as the antenna at the receiver.

3,710,123
PNEUMATIC PULSE COUNTER

Robert C. Miller, Frederic Polk, Wis., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 16, 1971, Ser. No. 115,462
Int. Cl. G06m *1/00*
U.S. Cl. 235—201 ME **1 Claim**

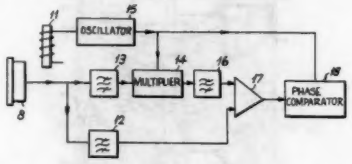


A pneumatic pulse counter in which a moveable count shaft is responsive to a pneumatic input signal at a first input port thereby providing, by means of a count pawl, a predetermined movement to a memory shaft. The final position of the memory shaft is frictionally retained by a retaining pawl while the count shaft returns to its initial position ready to respond to another input signal. A third shaft is provided responsive to a pneumatic input at a second input port to contact the retaining and count pawls thereby allowing the memory shaft to return to its initial position. Upon a total predetermined movement of the memory shaft, without the occurrence of an input at the second input port, an output signal is provided.

3,710,124
OPTICAL MEASURING APPARATUS COMPRISING OSCILLATOR AND PHASE COMPARATOR

Leonard Alfred Sayce, and Knut Indergaard Jespersen, both of Glasgow, Scotland, assignors to National Research Development Corporation, London, England

Filed March 18, 1971, Ser. No. 125,643
Claims priority, application Great Britain, March 25, 1970, 14,533/70; July 20, 1970, 35,141/70
Int. Cl. H01j *39/12*; G01b *11/04*
U.S. Cl. 250—206 **12 Claims**

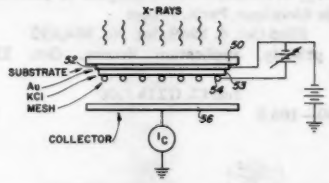


In apparatus for measuring displacement, a scale grating is secured to an object whose displacement is to be measured and a real or simulated index grating is periodically vibrated through a distance equal to a constant fraction of the grating spacing. Collimated light falling successively on the two gratings is directed on to a photoelectric element. The phase of the alternating output signal from the photoelectric element relative to the phase of the periodic movement of the index grating provides a measure of the displacement of the scale grating relative to the mean position of the index grating.

3,710,125
SECONDARY EMISSION ENHANCER FOR AN X-RAY IMAGE INTENSIFIER

John E. Jacobs, Evanston, Ill., and Michael G. Kovac, Princeton, N.J., assignors to Northwestern University, Evanston, Ill.

Filed April 29, 1970, Ser. No. 32,972
Int. Cl. H01j *31/50*
U.S. Cl. 250—213 VT **11 Claims**



The number of electrons emitted from a metal surface that is being bombarded by x-rays is increased by utilizing a secondary electron emission process within an insulator, potassium chloride (KCl), that is deposited on a metal, gold (Au) layer. The problem of obtaining a maximum electron yield from these layers is one of optimizing the secondary electron emission in the KCl for a given x-ray energy. This optimization is a function of the thickness of the KCl, its density, temperature, and an internal electric field.

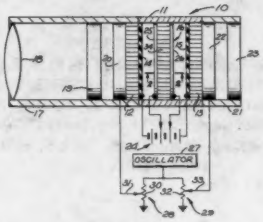
3,710,126
RESOLUTION ENHANCEMENT OF IMAGE INTENSIFICATION SYSTEMS

Philip George Reif, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 4, 1971, Ser. No. 195,742
Int. Cl. G02f *1/18*; H01j *31/50, 39/12*
U.S. Cl. 250—213 VT **25 Claims**

An image intensification system utilizing an image intensifier having a channel type electron multiplier. The light input to

the intensifier is oscillated vertically up and down by an electrically active double refracting input crystal. An oscillator provides an A.C. voltage for the crystal. The light output of the intensifier is unscrambled by another such crystal at the intensifier output, which crystal also receives an input from the oscillator. That is, the intensifier oscillating output image is



made to appear stationary by operation of the output crystal. Another embodiment employs a vidicon at the intensifier output, the vidicon vertical sweep being amplitude modulated in synchronism with the oscillator output. Although completely unexpected, the intensifier resolution is substantially improved.

3,710,127

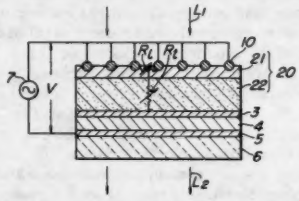
SOLID-STATE IMAGE CONVERTER HAVING COMPOSITE ENERGY SENSING ELEMENT

Tadao Kohashi, Yokohama; Tadao Nakamura, and Shigeaki Nakamura, both of Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 793,137, Jan. 22, 1969, abandoned. This application April 19, 1971, Ser. No. 135,417

Int. Cl. H01j *31/50*

U.S. Cl. 250—213 R **3 Claims**



A solid-state image converting device wherein the luminescence of a luminescent element is controlled by the variation in the impedance of an energy sensitive element with incident energy. The energy sensitive element is a composite element comprising a highly sensitive and highly responsive element and a high resistance and high breakdown voltage element, whereby a highly sensitive and highly responsive device to which a sufficient operating voltage can be applied is provided.

3,710,128

METHOD AND DEVICE FOR PHOTOELECTRICALLY SCANNING AN OBJECT BY MEANS OF AN OPTICAL BEAM

Helmut Kubisiak, Leverkusen, Germany, assignor to Exatest Messtechnik GMBH, Leverkusen, Germany

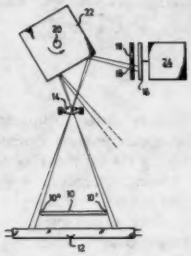
Filed Nov. 25, 1970, Ser. No. 92,656

Claims priority, application Germany, April 2, 1970, P 20 15 694.9

Int. Cl. G01n *21/30*

U.S. Cl. 250—219 WD **18 Claims**

This method is used for determining the position of width of an object, for example a wire or a metal strip. The object, which may either be glowing or else be illuminated from its backside, is scanned by an optical beam. As the beam crosses the edges of the object there is a jump in the illumination level; this is detected by a photoelectric detector. The illumination jump is not sharply defined; but it is known that the point at which the illumination level is just half of its maximum value corresponds to the instant at which the beam crosses the edge. This half-value point is difficult to detect in the case of the non-illumination to illumination transition, for at the time the illumination is passing through the half-value, it is not yet



known what the full value is going to be. This invention palliates that disadvantage by prescanning the object by means of an auxiliary optical beam just before the scanning of the object by the main optical beam; the maximum value of the illumination as determined by this prescanning is then used as the reference. An output signal is generated by a coincidence detector at the instant when the value of the illumination of the main scanning beam just equals half the maximum value determined by the prescanning.

3,710,129

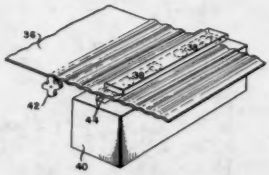
METHODS OF AND APPARATUS FOR DETECTING MINUTE HOLES IN OBJECTS

Harry T. Gibson, 9511 Warfield Road, Gaithersburg, Md.

Filed Feb. 16, 1971, Ser. No. 115,281

Int. Cl. G01n *21/32*; H01j *7/24*

U.S. Cl. 250—219 DF **14 Claims**



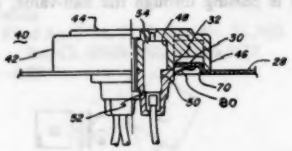
Methods of and apparatus for detecting minute holes in objects by using photoelectric cell means, such as a photomultiplier. Each object to be tested is placed or moved between a light source and the photoelectric cell means and suitably sealed from extraneous light so that the only light that can activate the photoelectric cell means comes through one or more holes or cracks in the object. The method is practiced by flexing the article during the inspection thereof by any one of a number of means in order to be certain that any hole is not inadvertently closed by virtue of its disposition and/or size in the object being tested. A flexible light seal means is disclosed which permits ease of inspecting discrete articles. In order to increase the sensitivity of the photoelectric cell means, there is disclosed means for lowering the thermal noise thereof whereby it may be operated at higher per stage voltages without becoming unstable.

3,710,130

MOUNTING STRUCTURE FOR USE IN LUMINAIRE

James Ronald Pate, Memphis, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 10, 1971, Ser. No. 114,222
Int. Cl. F21s 1/10; H01j 5/02; H02b 1/02
U.S. Cl. 250—239 2 Claims



Outdoor luminaires are frequently equipped with photoelectric sensing elements to control the operation of the luminaire as a result of the ambient light conditions about the luminaire. The sensing elements are mounted and then oriented toward the north to ensure proper operation. To effect this mounting which allows angular setting of the element, the element is mounted in a mounting receptacle having a cylindrical body designed to fit within a cylindrical aperture in a mounting surface. A push-on spring, of the type known and sold under the trademark "Speed Nut," is secured onto the receptacle wall to affix the receptacle to the mounting surface in a manner allowing angular setting of the receptacle element.

ERRATUM

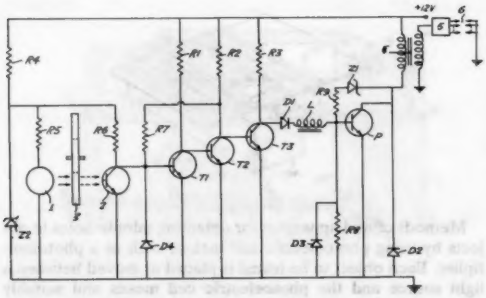
For Class 307—300 see:
Patent No. 3,710,041

3,710,131

TRANSISTORIZED IGNITION SYSTEMS

Eric Harold Ford, London, England, assignor to Lumenition Limited, London, England

Filed Dec. 27, 1971, Ser. No. 212,196
Claims priority, application Great Britain, Jan. 8, 1971, 1,029/71; Jan. 26, 1971, 3,173/71; Jan. 26, 1971, 3,174/71
Int. Cl. F02p 3/02
U.S. Cl. 307—10 R 7 Claims



A transistorized ignition system for switching the primary winding of an ignition coil of an internal combustion engine having the following improvements over the system disclosed in U.S. Pat. No. 3,605,712:

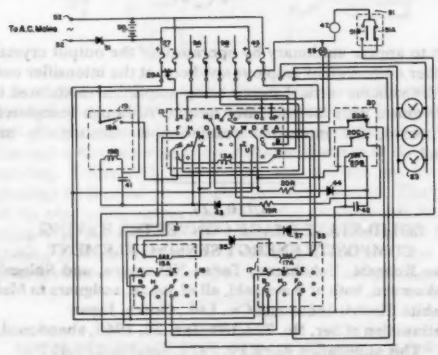
a. protection of the power transistor against positive going transients by means of a zener diode;
b. protection of the power transistor against negative going transients by means of a diode;
c. clean switching of the photo-transistor constituting the infra-red detection device by means of a diode connected thereacross;
d. a lensing system for the infra-red lamp and photo-transistor to ensure that the radiation beams from the lamp to the photo-transistor all converge at a point in the plane of the rotating chopper disc; and
e. slow down of the rate of switching of the power transistor by means of an iron cored inductor between the output of the trigger and the base electrode of the power transistor.

3,710,132

TIME CENTERING APPARATUS FOR RAILROAD INSTALLATIONS AND OTHER USES

Giovanni Salutati, via del Romitino 27, Firenze, Italy

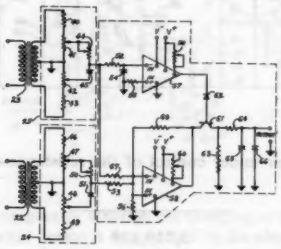
Filed Sept. 3, 1971, Ser. No. 177,706
Claims priority, application Italy, Sept. 5, 1970, 9652 A/70
Int. Cl. G04c 11/04
U.S. Cl. 307—43 8 Claims



A time centralizing apparatus, such as used in railroad installations, includes a line section having a plurality of stations each having a repeated panel. A pilot generator at one end of the line section transmits synchronizing electric pulses to the station nearest thereto, with the repeater panel of each station being adapted to synchronize clocks or other local servo devices and to transmit, to the next succeeding station, the sequence of pulses received thereby. A second or auxiliary generator at the opposite end of the line section is operable, responsive to non-arrival of pulses from the pilot generator, to transmit synchronizing electric pulses in the opposite direction along the line station to synchronize the cutoff stations. A respective reversing relay at each repeater panel normally conditions the associated panel to receipt of pulses from the pilot generator, and respective means at each repeater panel is operable, responsive to non-arrival of pulses from the pilot generator, to operate the reversing relay to condition the associated repeater panel to receipt of pulses from the second or auxiliary generator. A first time-responsive micro-relay at each station is maintained energized by a condenser which is charged by pulses received from the pilot generator. A second time-responsive micro-relay is provided and maintained energized by a condenser which is charged by pulses received from the second or auxiliary generator, and thus is normally deenergized. Upon non-arrival of pulses from the pilot generator, the condensor of the first relay looses its charge and the relay is deenergized to close an energizing circuit for the operating coil of the reversing relay, this energizing circuit being closed through a contact of the second relay. The reversing relay is thus operated. Upon restoration of pulses from the pilot generator, the auxiliary generator causes to transmit pulses. This results in discharge of the condensor associated with the second micro-relay, so that this second micro-relay is deenergized and opens the energizing circuit for the reversing relay. The latter thus is restored to a "normal" position in which it cuts off receipt of pulses from the second or auxiliary generator, and the first relay is energized, by charging of its condenser by pulses from the pilot generator, to open its contact included in the energizing circuit for the operating winding or

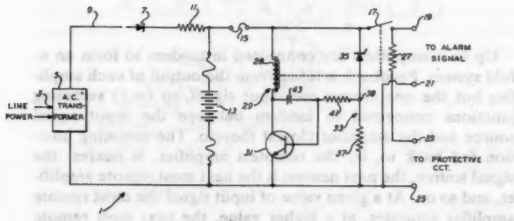
coil of the reversing relay. A feature of the invention is that each station has its own local source of potential which is preferably supplied from a battery charged through a rectifier from the usual lighting circuit.

3,710,133
SYNCHRONIZATION OF STATIC INVERTERS
Ralph J. Ferraro, Piscataway, N.J., assignor to Ward Leonard Electric Co., Inc.
Filed Sept. 9, 1970, Ser. No. 70,718
Int. Cl. H02j 7/00
U.S. Cl. 307—66 9 Claims



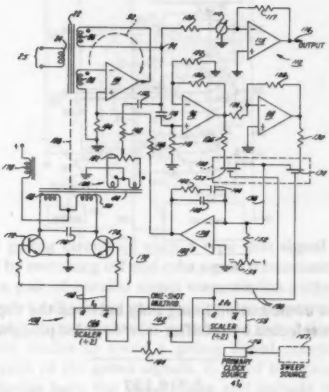
A system for synchronizing the static inverter enables the phasing of the output from a static inverter in correspondence to an alternate power supply. The synchronized system compares the static inverter output with the alternate power source in a phase detector which outputs an error correcting signal which is used to adjust the static inverter master clock.

3,710,134
POWER SUPPLY FOR ALARM SYSTEM
Leo A. Guthart, Old Westbury, N.Y., assignor to Alarm Device Manufacturing Company, Syosset, Long Island, N.Y.
Filed May 10, 1971, Ser. No. 141,660
Int. Cl. H02j 7/00
U.S. Cl. 307—66 7 Claims



A power supply for alarm systems. Under normal power conditions the disclosed circuit rectifies A.C. house current and provides 6 volt D.C. power to the alarm protective and signal circuits. Rechargeable batteries are disposed in the supply circuit so as to be kept at full potential by a constant trickle charge, and if house current fails the batteries are automatically available to power the alarm system. Intermittent switching and delay means are provided in the circuit and function such that if the batteries are placed under load, as by ringing an alarm bell, the batteries are intermittently removed from the load circuit thereby prolonging their life and the period during which alerting by the alarm system is possible.

3,710,135
ALTERNATING AND DIRECT CURRENT TRANSFORMER USING HARMONIC MODULATOR
Roswell A. Gilbert, New York, N.Y., assignor to Technical Management Services, Inc., Westfield, N.J.
Filed Jan. 15, 1971, Ser. No. 106,779
Int. Cl. H03c 1/10; H03k 7/02, 17/80
U.S. Cl. 307—88 R 22 Claims

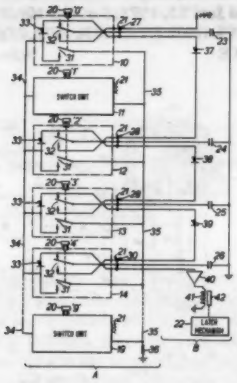


The harmonic modulator, preferably a single-core second harmonic modulator, is made into a transformer capable of transforming both alternating and direct currents by the use of two output windings on the core, a "drive" winding and a "sense" winding. A high-gain amplifier is connected to the drive and sense windings in a first feed-back loop to quickly balance and maintain the voltage across the sense winding at zero, and to thus maintain the rate of change of flux in the core at zero. A second feed-back loop detects the second harmonic content of the output signal from the core, and feeds a signal back to the amplifier to balance out flux caused by very low frequency or direct current input signals. The modulator preferably uses a spiral tape magnetic core whose ends are connected together to form a short-circuited secondary winding for an energizing transformer. The end connection preferable passes through the core laminations so as to avoid unbalancing the device.

3,710,136
ELECTRONIC COMBINATION LOCK
Geoffrey Ernest Patrick Constable, and Godfrey George Holter, both of Cheltenham, Gloucestershire, England, assignors to Smiths Industries Limited, London, England
Filed Jan. 27, 1971, Ser. No. 110,191
Int. Cl. H01h 47/00; E05b 47/00
U.S. Cl. 307—109 2 Claims

A combination lock includes four capacitors that are connected via rectifier-intercoupled plugs to the sockets of selected ones of 10 switch units which have individual push-buttons annotated with the digits "0" to "9." Operation of the push-buttons of the selected switch units in turn to enter a four-digit combination programmed by the plugging, transfers electric charge from one to the other of the capacitors and thence to energize a solenoid to release a latch mechanism of the lock. Digit-entry deviating from the programmed sequence discharges the capacitors to inhibit charge transfer to the solenoid until the sequence is restarted. In a modifica-

tion the four capacitors are replaced by capacitors in the individual switch units, charge transfer in response to entry of



the correct combination being only between the capacitors of those units selected by rectifier-intercoupled plugging.

3,710,137

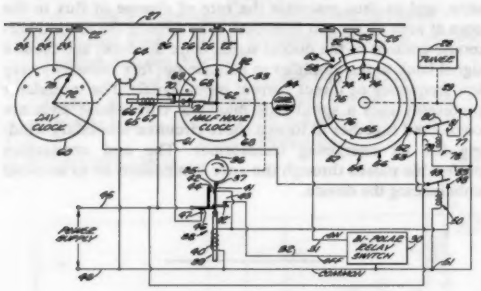
CONTROL SYSTEM AND METHOD

Albert Lee Stephens, Jr., 232 South June St., Los Angeles County, Calif.

Continuation-in-part of Ser. No. 534,090, March 14, 1966. This application Aug. 6, 1970, Ser. No. 61,732

Int. Cl. H01h *43/08*

U.S. Cl. 307—141 **6 Claims**



An electrical apparatus for making a plurality of electrical contacts selectively in succession and momentarily or for predetermined and lengthy time intervals is disclosed. The apparatus is so arranged that these contacts may be made by a card that can be punched or merely indented to select the time and service desired.

3,710,138

DRYER CONTROL

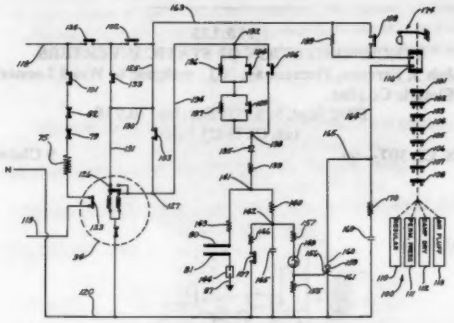
Curran D. Cotton, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Division of Ser. No. 803,687, March 3, 1969. This application March 15, 1971, Ser. No. 124,042

Int. Cl. F26b *25/22*

U.S. Cl. 307—118 **11 Claims**

This control system for a clothes dryer includes a fabric dryness sensing circuit comprising a resistance-capacitance circuit portion, a neon tube, and a thyristor in the form of an SCR operable for initiating termination of the dryness sensing operation. A chime indicating the end of the drying or sensing operation is operable during the cool-down operation in a repeating manner under control of the resistance-capacitance timing circuit.



3,710,139

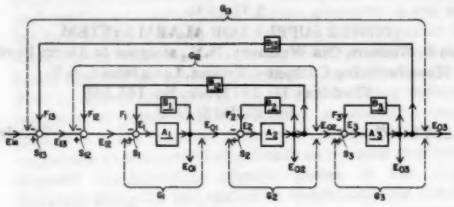
AMPLIFIER SYSTEM

Alan J. Werner, Brighton, N.Y., assignor to Sybron Corporation

Division of Ser. No. 633,294, April 24, 1967, Pat. No. 3,500,153. This application Nov. 28, 1969, Ser. No. 880,443

Int. Cl. H03k *17/00*

U.S. Cl. 307—229 **7 Claims**



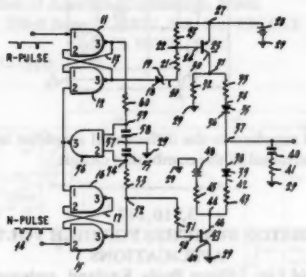
Up to n amplifiers are connected in tandem to form an n-fold system. Feedback is taken from the output of each amplifier but the one closest the input signal, to (*n*-1) summing junctions connected in tandem between the input signal source and the amplifier closest thereto. The summing junction fed back to, by the remotest amplifier, is nearest the signal source, the next nearest is the next most remote amplifier, and so on. At a given value of input signal the most remote amplifier saturates, at a higher value, the next most remote saturates, and so on, so as the signal increases amplifiers saturate, one after the other. When any given amplifier saturates, the unsaturated amplifier nearest it has a sharp increase in its output signal, until it, too, saturates. A pair of parallelled two-fold systems provide a controller controlling a valve, by switching a motor on to open the valve, on to close the valve, or off to hold the valve in position. The inputs to the system are connected by the high resistance of a field effect transistor. The amplifiers more remote from the inputs are set to saturate when one input signal is higher than the other by more than enough to switch the motor on. If such saturation occurs, one of the less remote amplifiers sharply increases its output and thereby causes the field effect transistor to present a low resistance shunting the inputs and therefore limiting the difference between the signals applied to the inputs.

3,710,140

FLIP-FLOP AND HOLD PHASE DETECTOR

Hubert Marie Volmerange, Woodland Hills, Calif., assignor to RCA Corporation

Filed Nov. 9, 1970, Ser. No. 87,990
Int. Cl. H03b 3/04; H03d 13/00
U.S. Cl. 328—133 5 Claims



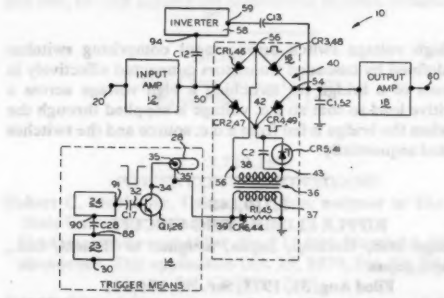
A phase comparator wherein the charging or discharging of a charge storage device is determined by the phase or time difference between first and second pulse signals.

3,710,141

SAMPLE AND HOLD CIRCUIT

Kenneth K. Zeiger, Levittown, Pa., assignor to Inter-Computer Electronics, Inc., Lansdale, Pa.

Filed July 23, 1971, Ser. No. 165,645
Int. Cl. H03k 17/00
U.S. Cl. 307—235 23 Claims



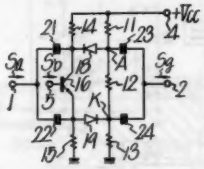
A circuit for sampling a waveform voltage during a predetermined small sample time period and then holding the sampled voltage for a long hold period relative to the sample period. A waveform signal is impressed at the input of a diode bridge. A storage or hold capacitor is connected at the output of the bridge. A zener diode having a zener or breakover voltage greater than the voltage of the waveform, prevents current flow through the bridge during the hold period. The leading edge of a trigger pulse forward biases the bridge and overcomes the zener voltage, to enable the storage capacitor to reach a voltage level equal to the instantaneous voltage appearing at the bridge input. The trailing edge of the pulse turns "off" the bridge, and the zener voltage of the zener diode holds the bridge "off" until the next trigger pulse.

3,710,142

SIGNAL GATING CIRCUIT

Hideo Yokoyama, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 2, 1971, Ser. No. 159,291
Claims priority, application Japan, July 4, 1970, 45/66887
Int. Cl. H03k 17/00
U.S. Cl. 307—242 12 Claims



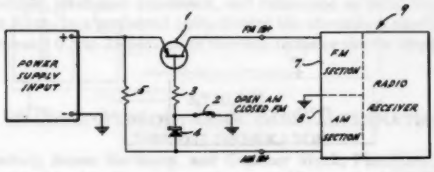
A signal gating circuit of such a type that signal gating is performed by switching off and on a signal transmission circuit which has a pair of parallel signal transmission paths, each of which includes a diode for gating a signal in response to a gating signal and circuit means for combining gated signals from both of said diodes to avoid a gating signal component included in each of the gated signals. Both of the gated signals from the diodes have the same phase and include the gating signal components of opposite phases to each other.

3,710,143

ELECTRONIC SWITCH

Ralph Bray, Philadelphia, and Clement W. Rowan, Warminster, both of Pa., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Filed Aug. 6, 1971, Ser. No. 169,658
Int. Cl. H03k 17/00
U.S. Cl. 307—244 5 Claims



A circuit for switching the power supply between the FM and AM sections of an AM-FM radio receiver. A single-pole single-throw switch is used in conjunction with a transistor circuit to provide the required single-pole double-throw switching function.

3,710,144

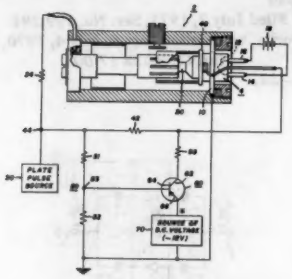
HIGH POWER MICROWAVE SYSTEM HAVING LOW DUTY CYCLE

Arthur L. Jackson, Owensboro, Ky.; Shelby A. Jolly, Rockport, Ind., and John B. Quirk, Owensboro, Ky., assignors to General Electric Company

Filed June 29, 1971, Ser. No. 157,987
Int. Cl. H03k 5/01
U.S. Cl. 307—260 3 Claims

A microwave system is disclosed wherein a microwave module is capable of providing a high power pulse of short duration with long off-duty periods. Standby means which may include a separate power source are provided to cause the electron discharge device powering the module to conduct

during the off-duty periods. In a preferred embodiment, switching means to disconnect the power source from the

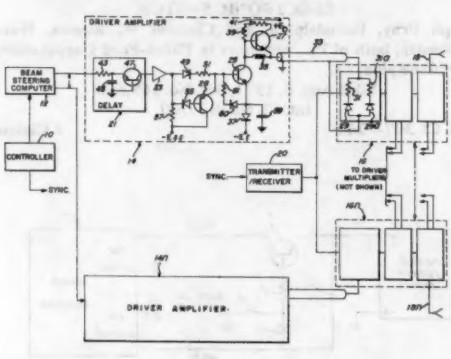


electron discharge device during the duty cycle are also provided.

3,710,145
IMPROVED SWITCHING CIRCUITRY FOR SEMICONDUCTOR DIODES

Robert T. Williamson, Concord, and Christos J. Georgopoulos, Lowell, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 1, 1971, Ser. No. 111,424
Int. Cl. H03k *1/00, 17/00*
U.S. Cl. 307—270 **3 Claims**



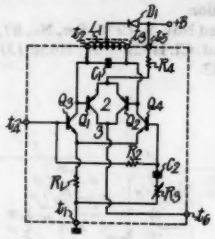
A driver amplifier for p-i-n diodes in the phase shifters of a phased array antenna, such amplifier being arranged so as to produce, in response to a command signal from a beam steering computer, either a forward-bias or a back-bias signal for such diodes, the particular bias signal produced by such amplifier being delayed by substantially the same length of time after application of a command signal.

3,710,146
FREQUENCY DOUBLER CIRCUIT

Mitsuo Ohsawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 7, 1971, Ser. No. 160,451
Claims priority, application Japan, July 9, 1970, 45/60063
Int. Cl. H03k *1/16*
U.S. Cl. 307—271 **6 Claims**

A frequency doubler circuit including a differential amplifier supplied with a signal of a predetermined frequency, for example, a pilot signal of 19KHz contained in an FM stereophonic signal, a pair of rectifier circuits coupled to outputs of the differential amplifier to rectify the signal of the predetermined frequency and a combining circuit to combine the rectified signals, whereby a signal of a frequency twice that



of the signal supplied to the differential amplifier is derived at the output terminal of the combining circuit.

3,710,147
TRANSISTOR SWITCHES FOR HIGH VOLTAGE APPLICATIONS

Martin David Lee, Lilliput Poole, England, assignor to Plessey Handel Und Investments A.G., Zug, Switzerland

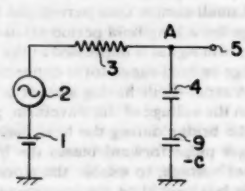
Filed June 29, 1971, Ser. No. 158,005
Int. Cl. H03k *17/56*
U.S. Cl. 307—246 **4 Claims**

A high voltage switch arrangement comprising switches each defined by cascaded transistors connected effectively in the arms of a bridge for switching a high voltage across a capacitive load so that an a.c. voltage is supplied through the load when the bridge is fed from a d.c. source and the switches operated sequentially.

3,710,148
RIPPLE ELIMINATING CIRCUIT

Hisatsugu Itoh, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 31, 1971, Ser. No. 176,611
Claims priority, application Japan, Aug. 31, 1970, 45/75538
Int. Cl. H03k *1/16*
U.S. Cl. 307—295 **15 Claims**



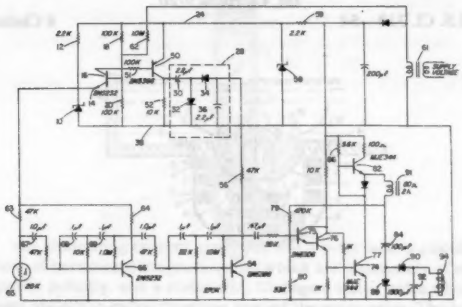
A ripple eliminating circuit including in series a high power DC source, a capacitor and a negative capacitance circuit hav-

ing a negative capacitance the absolute value of which is nearly equal to that of said capacitor wherein an output is derived from across the circuit having in series said capacitor and said negative capacitance circuit.

3,710,149
ELECTRICAL CIRCUITRY

Elihu Craig Thomson, Wellesley, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Filed June 21, 1971, Ser. No. 155,062
Int. Cl. H03k 17/00
U.S. Cl. 307—310 **10 Claims**



The invention describes a fail safe voltage responsive circuit for producing an output level indicative of the relationship between two voltage levels. The voltage responsive circuit includes a fail-safe comparison circuit which assumes alternative modes in response to an alternating signal introduced into the comparison circuit when the voltage levels are within a predetermined range, one relative to the other. When the voltage levels are outside the range or if a component fails, the comparison circuit ceases to alternate between modes. The voltage responsive circuit is used in a preferred application involving a fail-safe combustion control system wherein one voltage level is used to supply bias current to a photoconductive cell, the cell sensing the presence or absence of flame.

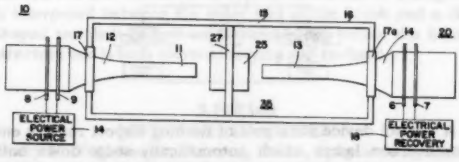
ERRATUM

For Class 307—131 see:
Patent No. 3,710,157

3,710,150
POWER CONVERSION MEANS

Robert C. McMaster, Columbus, Ohio, assignor to The Ohio State University, Columbus, Ohio

Continuation-in-part of Ser. No. 713,034, March 14, 1968, abandoned. This application Oct. 29, 1970, Ser. No. 85,096
Int. Cl. H01v 7/00
U.S. Cl. 310—8.1 **6 Claims**

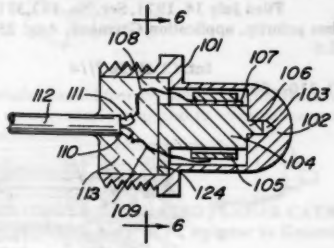


The invention is for a system for frequency conversion of large magnitudes of electrical or mechanical power, or of electrical into mechanical power, or of mechanical into electrical power. Power levels of the order of many horsepower are connected to lower or higher frequencies by impact coupling of high-power sonic transducers.

3,710,151
ELECTROACOUSTIC TRANSDUCER FOR USE AT HIGH TEMPERATURES AND PRESSURES

Frank Massa, and John F. Hubbard, both of Cohasset, Mass., assignors to Massa Division, Dynamics Corporation of America, Hingham, Mass.

Filed March 29, 1971, Ser. No. 128,802
Int. Cl. H04r 17/00
U.S. Cl. 310—8.9 **6 Claims**



An electroacoustic transducer is encased in a unitary housing, preferably machined from a single block of material, which is chemically inert, sound conducting, and sealed against moisture seepage when the transducer is immersed, under high pressure, in a hot chemical. The transducer is for immersion, as a production control sensor, in a hot corrosive fluid being chemically processed under high pressure.

3,710,152
CHROMIUM ELECTRODES FOR MAGNETOHYDRODYNAMIC GENERATORS

Patrick F. Goolsby, Florence, Ala., assignor to Reynolds Metals Company, Richmond, Va.

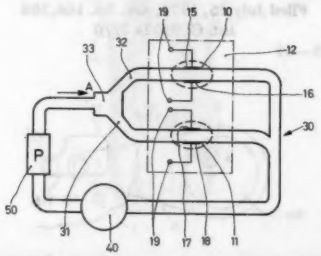
Filed June 26, 1970, Ser. No. 50,334
Int. Cl. H02k 4/02
U.S. Cl. 310—11 **10 Claims**

A thermionic-emitting chromium electrode for magnetohydrodynamic generators possessing excellent electrical stability, oxidation resistance, and resistance to basic slags is set forth. In a preferred embodiment the chromium electrode contains 0.5 to 25 percent of thorium oxide or similar dopants.

3,710,153
MAGNETOHYDRODYNAMIC (MHD) ALTERNATING CURRENT GENERATOR

Ludwig Benno Barbacsy, and Gunther Muck, Plantikow, Ulrich, Munich, Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Oct. 20, 1970, Ser. No. 82,411
Claims priority, application Germany, Oct. 22, 1969, P 19 53 163.6
Int. Cl. H02n 4/02
U.S. Cl. 310—11 **7 Claims**



An MHD alternating current generator for electric power supply, preferably for aerospace application having a liquid, conducting medium, e.g., a liquid metal, which is alternately

moved in only one of, e.g., two channels which are located within a steady magnetic field perpendicular to the direction of flow "A," the magnetic field being produced by superconducting coils.

3,710,154

CONVERTIBLE POWER TOOL

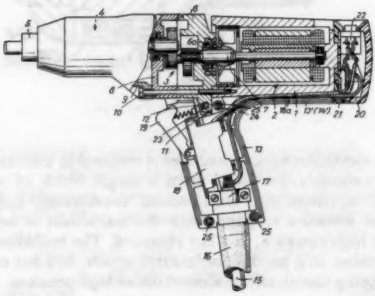
Rainer Schilling, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed July 14, 1971, Ser. No. 162,371

Claims priority, application Germany, Aug. 25, 1970, P 20 42 012.6

Int. Cl. H02k 7/14

U.S. Cl. 310—50 **9 Claims**



A convertible portable power tool has a cylindrical housing for a high-frequency electric motor whose output shaft extends forwardly into bearings provided in a flange which is bolted to the front portion of the housing. The flange has a small outwardly projecting lobe which is connectable with the shells of a plastic central handle. The flange further contains bearings for the shaft or shafts of a reducing gearing which is mounted in front of the flange and serves to drive the input member of a transmission for the tool spindle. The rear end of the motor housing is adjacent to a multi-section cap which contains a reversing device for the motor and is connected by screws to extensions provided on the sections of the handle. Such extensions define a channel for conductors which connect the motor with a switch in the interior of the handle. When the handle is removed and the cap is replaced with a cap which is connected to an energy source and contains an electric switch, the power tool can be used as a handle-free portable hand motor. The prefabricated units of the motor are assembled in accordance with the mechanical assembly technique.

3,710,155

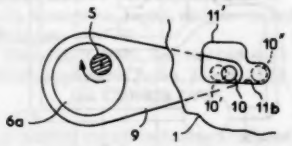
NON-RETURN, DIRECTION OF ROTATION SELECTING DEVICE FOR SYNCHRONOUS MOTOR

Jean Jullien-Davin, Valence, France, assignor to Crouzet, Paris, France

Filed July 26, 1971, Ser. No. 166,204

Int. Cl. H02k 7/10

U.S. Cl. 310—41 **4 Claims**



A non-return device for a synchronous motor comprising a rotor supported between two brackets and having no preferential rotation direction per se, an eccentric on the rotor axis, an arm mounted on said eccentric through one of its ends and at the other end a contact plug or crank pin and a groove (or port) in a bracket so as to receive said contact plug, this groove comprising thrust bearing means for said contact plug for one direction of rotation of the motor.

3,710,156

ROTATING ELECTRIC MACHINE WITH EVAPORATION COOLING

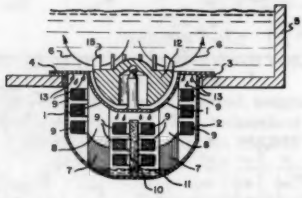
Nikolaus Laing, Hofener-Weg 35-37, Aldingen near Stuttgart, Germany

Filed Nov. 30, 1970, Ser. No. 93,531

Claims priority, application Austria, Dec. 1, 1969, 11203

Int. Cl. H02k 9/20

U.S. Cl. 310—54 **6 Claims**



An electric rotating machine having a stator or a pole ring producing a rotating magnetic field and a rotor supported in the fluid being conveyed where said stator or pole ring is hermetically sealed in a housing which is filled with a saturated vapor of an electrically non-conducting material whose boiling point is below the highest permissible temperature of components producing electric resistance power.

3,710,157

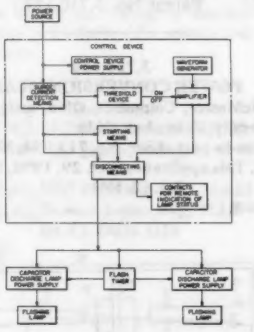
METHOD OF MONITORING AIRPORT RUNWAY END IDENTIFICATION LAMPS

Donald F. Wright, Dundas, Ontario, Canada, assignor to Westinghouse Canada Limited, Hamilton, Ontario, Canada

Filed Feb. 23, 1972, Ser. No. 228,538

Int. Cl. H01h 35/00

U.S. Cl. 307—131 **5 Claims**



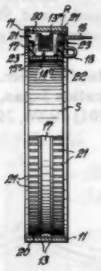
A control device for a pair of flashing airport runway end identification lamps which automatically shuts down both lamps when either lamp ceases to flash, and thereby avoids the pilot confusion which could result from a single flashing lamp. This device monitors the surges of line current which flow due to flashing of the lamps and compares a signal, which varies according to the magnitude of the surges, with a threshold, and, if the comparison indicates that both lamps are not flashing, automatically disconnects the power to both lamps.

3,710,158

ALTERNATING CURRENT GENERATOR WITH RADIAL STATOR POLES

Karl Bachle, Stetten; Ludwig Finkbeiner, Walheim, and Bernd Taubitz, Pforzheim, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 1, 1971, Ser. No. 194,370
Claims priority, application Germany, Oct. 30, 1970, P 20 53 262.1
Int. Cl. H02k 21/12
U.S. Cl. 310—156 23 Claims



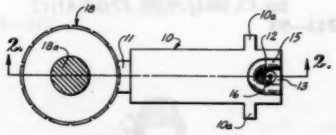
An alternating current generator has a rotor with a circular row of permanent magnetic poles which are alternately of opposite polarity, and a stator with U-shaped stator poles whose legs project in radial direction toward the rotor poles. The legs of each stator pole have circumferentially and axially spaced end portions located opposite two adjacent rotor poles of opposite polarity, respectively. An annular stator winding is located within the open annular space formed by the U-shaped stator poles.

3,710,159

ELECTRIC BRUSH AND LEAD HOLDER

Maurice V. Dupuis, Raytown, Mo., and John R. Greer, Shawnee Mission, Kans., assignors to Rival Manufacturing Company, Kansas City, Mo.

Filed July 15, 1971, Ser. No. 162,906
Int. Cl. H02k 13/00
U.S. Cl. 310—239 4 Claims



A combination electric brush and lead holder for electric motors has a spring located therein which urges the associated brush to extend outwardly of the holder in a telescoping fashion and into contact with a motor commutator. The spring is interposed between the inner end of the brush and a disc shaped terminal end of an electrical lead within the holder structure and is both current carrying and resilient.

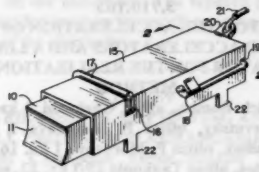
3,710,160

MOTOR BRUSH ASSEMBLY

Harry M. Voglesonger, Riverton, Conn., assignor to Dynamics Coporation of America, New York, N.Y.

Filed Aug. 12, 1971, Ser. No. 171,150
Int. Cl. H02k 13/00
U.S. Cl. 310—247 9 Claims

A brush holder assembly for an electric motor wherein during the useful life of the brush a spring wire clip bears against the brush through a slot in the brush housing to improve mechanical rigidity and electrical conductivity. When the brush wears to the extent that it no longer extends beneath the slot, the spring clip extends further down into the slot and obstructs the brush channel thereby preventing further extension of the brush compression spring and its eventual contact with the motor commutator.

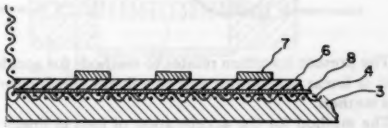


3,710,161

QUICK-HEATING IMPREGNATED PLANAR CATHODE

James E. Beggs, Schenectady, N.Y., assignor to General Electric Company

Filed Oct. 30, 1970, Ser. No. 85,428
Int. Cl. H01j 1/14, 19/06; H01k 1/04
U.S. Cl. 313—346 6 Claims



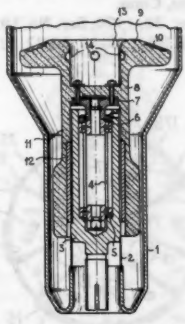
A quick-heating planar cathode employs a disk of fine mesh wire of refractory metal around which is bonded or sintered a porous layer of tungsten particles impregnated with electron-emissive material, a layer of inorganic insulation covering one surface of the porous cathode, and a heater on the insulating surface.

3,710,162

X-RAY TUBE HAVING A ROTARY ANODE

Francoise Bougle, Paris, France, assignor to Compagnie Generale de Radiologie, Paris, France

Filed Feb. 19, 1971, Ser. No. 116,879
Claims priority, application France, Feb. 27, 1970, 7007192
Int. Cl. H01j 35/10
U.S. Cl. 313—60 10 Claims



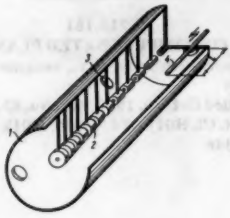
An X-ray tube having a rotary anode comprising a disc-shaped anode and a substantially cylindrical rotor, wherein the anode-rotor assembly is made integrally of a single piece of graphite, whose cylindrical rotor part is provided with a fer-

romagnetic hollow cylinder whereupon acts the rotating electromagnetic field produced by the stator.

3,710,163
METHOD FOR THE ACCELERATION OF IONS IN LINEAR ACCELERATORS AND A LINEAR ACCELERATOR FOR THE REALIZATION OF THIS METHOD

Vasily Alexeevich Bomko, ulitsa Garkushi 3 kv. 49; Evgeny Ivanovich Revutsky, ulitsa P. Morozava 1 kv. 3; Boris Ivanovich Rudiak, ulitsa P. Morozava 1 kv. 16, and Anatoly Vasilievich Pipa, ulitsa Tankopia 29/I kv. 33, all of Kharkov, U.S.S.R.

Filed Feb. 2, 1971, Ser. No. 111,838
Int. Cl. H05h
U.S. Cl. 313—63 **2 Claims**



The present invention relates to methods for acceleration of ions in linear accelerator and to a linear accelerator realizing this method.

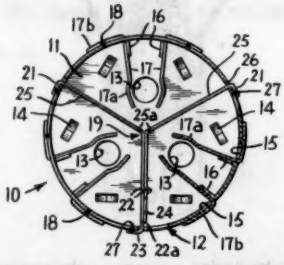
The method for the acceleration of ions in linear accelerators consisting of a cavity resonator 1 and drift tubes 2 employing a standing r.f. electromagnetic wave, according to the invention, is characterized in that the resonator is excited in the E_{011} mode enabling the energy of the accelerated-ion beam to be controlled continuously by establishing a region with a uniform distrubution of the accelerating field and by varying the extent of that tregion.

This method can be realized by a linear accelerator comprising a cavity resonator 1 with drift tubes 2; tuners 3 arranged on the side wall of the resonator 1; an additional tuning means made in the form of a conducting post 4 installed in an end wall of the resonator 1 near its side wall parallel with the axis of the resonator and capable of being moved along that axis.

3,710,164
CONVERGENCE CUP WITH ONE-PIECE SHIELD

Fred F. Rimmler, Manhasset, N.Y., assignor to The Stanley Works, New Britain, Conn.

Filed Dec. 30, 1970, Ser. No. 102,764
Int. Cl. H01j *29/08, 29/02, 31/20*
U.S. Cl. 313—77 **2 Claims**

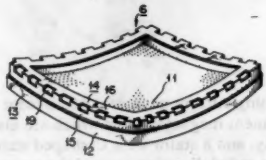


A convergence cup for use in color kinescopes includes an improved shield structure for magnetically separating the pairs of pole pieces. The one-piece shield is formed from a single metal strip with tabs at its ends by bending it 180° along a lateral line and cutting from the strip a third tab extending from the bend line, and bending the resulting legs 120° outwardly along central lateral lines to form a Y-shaped shield. The one-piece shield is then secured in position inside the cup by spot welding the tabs to the cup wall.

3,710,165
SHADOW MASK PERFORATED ALONG INTERSECTION OF SIDE WALL AND REINFORCING FLANGE

Asahide Tsuneta, Kawasaki, and Shinichi Sawagata, Tokyo, both of Japan, assignors to Tokyo Skibaura Electric Co., Kawasaki-shi, Japan

Filed July 26, 1971, Ser. No. 164,801
Claims priority, application Japan, July 3, 1970, 45/75341
Int. Cl. H01j *29/06, 29/02, 29/08*
U.S. Cl. 313—85 S **6 Claims**



In a shadow mask comprising a rectangular mask plate and a rectangular frame member including a rectangular side wall for supporting the mask plate and a reinforcing flange bent inwardly at right angles with respect to the side wall, there are provided a plurality of perforations along a border line between the side wall and the reinforcing flange.

3,710,166
GAS-FILLED IONIZATION COUNTER

Simon Meerovich Perelman; Evgraf Efremovich Petrenko; Isaak Aronovich Prager; Alexandr Andrianovich Timofeev, and Anatoly Filippovich Tolmachev, all of Moscow, U.S.S.R., assignors to Moskovsky Zavod Elektrovakuumnykh Priborov, Moscow, U.S.S.R.

Filed Jan. 15, 1970, Ser. No. 2,988
Int. Cl. H01j *39/26, 17/20, 61/12*
U.S. Cl. 313—93 **2 Claims**

A gas-filled ionization counter in which the cathode and anode are placed in an envelope filled with a gaseous mixture and form the main gas-discharge gap and which has a performance check facility. The said facility compris electrodes

placed in the gaseous mixture of the envelope and forming an auxiliary gap, and a radio-active source of specified activity, placed in the auxiliary gap so that its own radiation induces a gas discharge solely in the auxiliary gap. All this provided a check on the stability of the counter's characteristics in service.

3,710,167

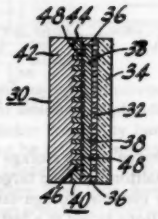
ORGANIC ELECTROLUMINESCENT CELLS HAVING A TUNNEL INJECTION CATHODE

Joseph Dresner, and Alvin Malcolm Goodman, both of Princeton, N.J., assignors to RCA Corporation

Filed July 2, 1970, Ser. No. 51,898

Int. Cl. H05b *33/02*

U.S. Cl. 313—108 A **14 Claims**



An electroluminescent cell comprises an anthracene layer having an anode and cathode thereon. The cathode of the novel cell is of the tunnel injection type. A typical cathode consists of a 10–100 A. thick layer of silicon dioxide deposited over a degenerate n type silicon body. The silicon dioxide layer of the cathode is placed in contact with the anthracene layer. The anode should provide hole injection into the anthracence layer. A preferred anode is a film of copper oxide and copper iodide.

3,710,168

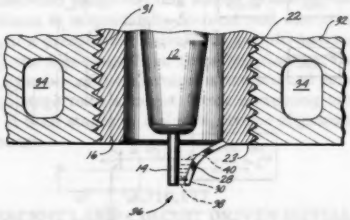
SPARK PLUG WITH TAPERED SPARK GAP

John J. Fernandez, 1620 S. Myrtle Ave., Monrovia, Calif.

Continuation-in-part of Ser. No. 815,538, April 14, 1969, abandoned. This application Aug. 11, 1971, Ser. No. 170,885

Int. Cl. H01t *13/20*

U.S. Cl. 313—141 **4 Claims**



A spark plug has a shell at one end of an insulator body, a central electrode extending through the insulator body beyond the shell, and a tapered ground electrode secured to the shell and extending alongside the central electrode. The ground electrode, from its point of connection with the shell to its tip, converges gradually toward the central electrode to form a tapered gap between the electrodes. The ground electrode provides a short path for conducting heat readily through the shell to the water jacket area of the engine cylinder block. The gradually tapered gap causes the spark to travel between different points in the gap, depending upon temperature and running conditions of the engine, which reduces wear on the electrodes. The tapered gap also allows good ventilation for gases in the spark gap area thereby reducing corrosion of the electrodes.

3,710,169

HALOGEN FILAMENT LAMP HAVING AN INTERNAL ALL PROTECTION ARRANGEMENT

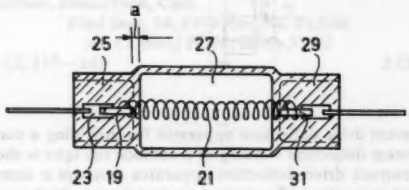
Germain Remi T'Jampens; Victor Rosallie Notelteirs, and Eduard Jozef Philomena Janssen, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1970, Ser. No. 12,693

Claims priority, application Netherlands, Feb. 21, 1969, 6902805

Int. Cl. H01j *5/50;* **H01k** *1/18*

U.S. Cl. 313—222 **5 Claims**



A halogen filament lamp having two pinch seals in which at least one of the seals a rod is embedded. The rod, which is secured at one end to a sealing foil and at the other end to the axially stretched filament, provides an improved internal fuse for the lamp.

3,710,170

X-RAY TUBE WITH ROTARY ANODES

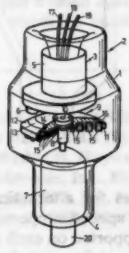
Rudolf Friedel, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Sept. 11, 1970, Ser. No. 71,556

Claims priority, application Germany, Oct. 11, 1969, P 19 51 383.8

Int. Cl. H01j *35/10*

U.S. Cl. 313—330 **19 Claims**

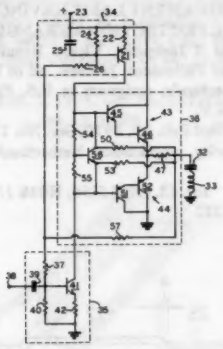


An X-ray tube has a rotary anode which is a compound body with parts of heavy metal and graphite, the focal point path lying upon the heavy metal. The invention is particularly characterized by the provision of at least one graphite part at the heavy metal part outside of the focal point path.

3,710,171
CURRENT DRIVE DEFLECTION APPARATUS UTILIZING CONSTANT CURRENT GENERATOR

Dong Woo Rhee, Williamsville, N.Y., assignor to GTE Sylvania Inc.

Filed June 8, 1970, Ser. No. 44,476
Int. Cl. H01j 29/70
U.S. Cl. 315—27 TD 17 Claims

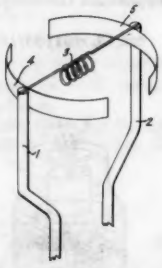


Current drive deflection apparatus for providing a current to a beam deflection winding of a cathode ray tube is shown. The current drive deflection apparatus employs a constant current generator and a current control means which provide a sawtooth current to the winding. Current drive deflection apparatus which employs a complementary current amplifier is also shown.

3,710,172
COMPOSITE THERMIONIC CATHODES FOR GAS DISCHARGE DEVICES

Harald L. Witting, Burnt Hills, N.Y., assignor to General Electric Co.

Continuation-in-part of Ser. No. 886,824, Dec. 22, 1969, abandoned. This application April 26, 1971, Ser. No. 137,580
Int. Cl. H01j 1/20, 19/14
U.S. Cl. 313—338 10 Claims

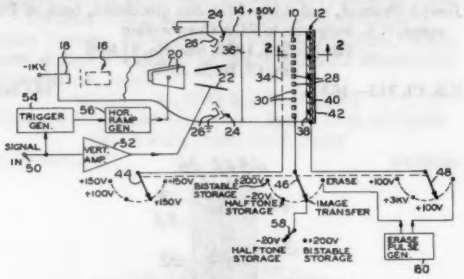


Thermionic cathodes for alternating cycle gas discharge devices have a pair of spaced supports, a filament connected between them, and supported on each conductor one or more thin metal members providing emission material of low work function at their surfaces, the surface area and mass of the members being such that they operate at a temperature at which they emit thermionically without overheating. The filament is directly heated while the thermionic emitting metal members are heated by the discharge thus providing good starting, long life, low cathode fall at high current levels, and cathode symmetry.

3,710,173
DIRECT VIEWING STORAGE TUBE HAVING MESH HALFTONE TARGET AND NONMESH BISTABLE TARGET

Thomas B. Hutchins, IV, Portland, Oreg., and William M. Templeton, Seattle, Wash., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed June 17, 1970, Ser. No. 47,005
Int. Cl. H01j 29/41
U.S. Cl. 315—12 14 Claims

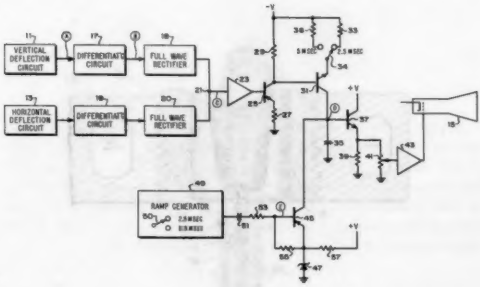


A direct viewing charge image storage tube is described in which a low density halftone storage target is employed along with a higher density bistable storage target. Charge images are written on the halftone target at a fast writing speed, up to about 300 million centimeters per second, and then such charge image is transferred to the bistable target where it is stored for a long time, up to one hour or more. The bistable storage target may be of the nonmesh type that employs a storage dielectric of phosphor material which emits a light image corresponding to the charge image stored thereon. The storage dielectric of a halftone target is more porous and lower density than the phosphor storage dielectric and may be a porous metal oxide, such as magnesium oxide, having a density of 2 to 5 percent of its normal bulk density which provides a target of low capacitance and extremely fast writing speed.

3,710,174
INTENSITY MODULATED TEARDROP DISPLAY FOR A VECTORCARDIOGRAPH

Joseph Anthony Cerniglia, Jr., 5 Norris Rd., Lynnefield, Mass.

Filed March 5, 1971, Ser. No. 121,468
Int. Cl. A61b 5/04
U.S. Cl. 315—22 6 Claims



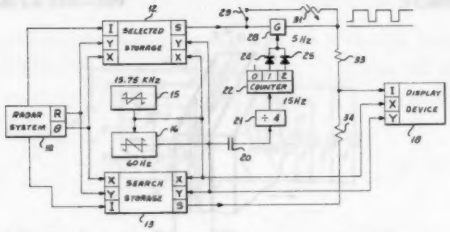
In a vectorcardiograph system, the vector loops are displayed as a plurality of teardrop-shaped dashes. The dashes are produced by modulating the beam of a cathode ray tube in response to the voltage developed across a charging capacitor. The charging rate of the capacitor is controlled by a current gate responsive to the velocity of the horizontal and vertical signals applied to the cathode ray tube. A pulse generator controls a gate to periodically discharge the capacitor, thereby to terminate one teardrop-shaped dash and begin another.

3,710,175

TWINKLE EFFECT DISPLAY SYSTEM IN WHICH INFORMATION IS MODULATED AT A RATE WITHIN THE FLICKER FREQUENCY OF THE HUMAN EYE

Howard S. Halpern, Stamford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed June 20, 1969, Ser. No. 835,141
Int. Cl. H01j 29/52
U.S. Cl. 315—30 3 Claims



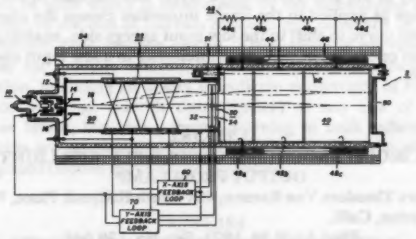
A twinkle effect display system comprises a display device, the intensity input of which is amplitude modulated at a rate within the usable flicker frequency band of the human eye. The modulation may be either symmetrical or asymmetrical and may be either continuous or in steps; and the index of modulation may range from one hundred percent to appreciably lower values which still provide a readily observable twinkling.

3,710,176

ELECTRON-OPTICAL RECORDING DEVICE

Kurt Schlesinger, Fayetteville, N.Y., assignor to General Electric Co.

Filed May 11, 1970, Ser. No. 36,098
Int. Cl. H01j 29/56
U.S. Cl. 315—31 R 10 Claims



An electron-optical recording device is provided comprising two cascaded image-forming stages. In the first stage an electron beam is magnetically focused and electrostatically deflected to a preselected aperture in a multi-aperture plate separating the first stage from the second stage. The beam emerging from one of the apertures is focused and deflected in the second stage onto a target. Error correcting means are provided in both stages to maintain proper alignment of the electron beam.

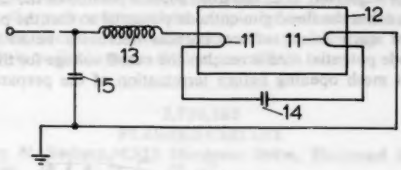
3,710,177

FLUORESCENT LAMP CIRCUIT DRIVEN INITIALLY AT LOWER VOLTAGE AND HIGHER FREQUENCY

Richard Ward, Worsley, England, assignor to Dahson Park Industries Ltd., Nottingham, England

Filed Nov. 9, 1971, Ser. No. 196,922
Claims priority, application Great Britain, Nov. 14, 1970, 54,327/70
Int. Cl. H05b 41/29
U.S. Cl. 315—106 5 Claims

A circuit for fluorescent lamps includes an inverter which incorporates means such as temperature dependent elements or switches whereby the voltage from the inverter is lower but at a higher frequency initially than during normal running.



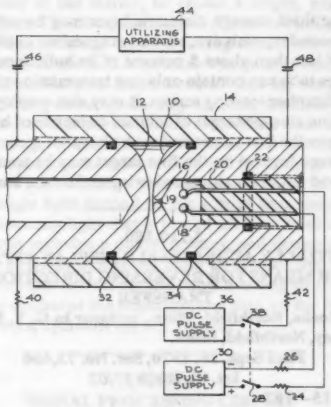
This inverter feeds a plurality of lamps, each having associated circuit elements which are resonant or semi-resonant at the higher frequency, to facilitate the lamps conducting.

3,710,178

SPARK-GAP TRIGGERING SYSTEM

David A. Johnson, Palo Alto, and Arthur F. Wickersham, Menlo Park, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Sept. 14, 1970, Ser. No. 71,960
Int. Cl. H01j 17/00; H05b 37/02
U.S. Cl. 315—149 3 Claims



A triggerable spark-gap is provided wherein the main gap discharge time is controlled by placing an auxiliary pair of discharge electrodes inside one of the main gap electrodes and causing a discharge for emitting ultra-violet light. The ultra-violet light illuminates the region in which the main discharge channel will form through a small aperture in the one of the main electrodes within which the auxiliary pair of electrodes are placed.

3,710,179

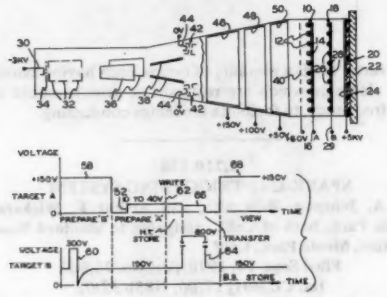
STORAGE TUBE HAVING TRANSMISSION TARGET WITH LOW DIFFERENTIAL CUTOFF

Raymond Hayes, and Wesley H. Hayward, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Sept. 14, 1971, Ser. No. 180,420
Int. Cl. H01j 29/41
U.S. Cl. 315—12 18 Claims

A direct viewing charge image storage tube is described including a transmission type storage target having an extremely low differential cutoff of about 0.1 to 0.2 volt and faster writing speed of about 100 to 500 centimeters per microsecond. This is achieved by employing a thick storage dielectric on the mesh electrode of the target, providing a low electrical field adjacent the rear of the target and applying a positive preparation pulse to the target electrode during bombardment by the

low velocity flood electrons until the potential of such dielectric is decreased to the cutoff voltage. The side portions of the dielectric surrounding each of the mesh openings continues to charge negatively after the front surface portion of the dielectric reaches the flood gun cathode potential so that the potential of each front surface portion decreases below such cathode potential until it reaches the cutoff voltage for the adjacent mesh opening before termination of the preparation



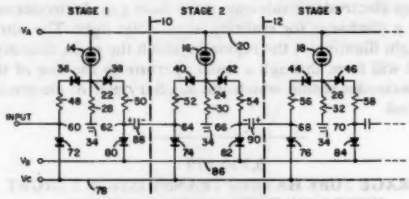
pulse. The thick storage dielectric layer may be made of low density secondary emissive, such as magnesium oxide having a density of less than about 5 percent of its bulk density. While the storage tube can contain only one transmission storage target and phosphor viewing screen, it may also employ a second transmission storage target of thinner dielectric of higher density between the first target and such phosphor screen so that a charge image formed on the first target may be transferred to such second target for storage viewing and over a longer time.

3,710,180

SEQUENTIALLY ADDRESSABLE DISPLAY APPARATUS WITH MEANS FOR REVERSING DIRECTION OF TRANSFER

John C. Rooks, Northfield, Minn., assignor to G. T. Schjeldahl Company, Northfield, Minn.

Filed Sept. 18, 1970, Ser. No. 73,456
Int. Cl. H05b 37/02
U.S. Cl. 315—153 **5 Claims**



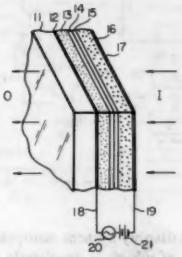
A sequentially addressable numerical display system wherein any of a variety of read-out display arrays such as an array of glow tubes or an AC powered load, such as incandescent lamps on a billboard can be illuminated in a predetermined serial fashion to produce a "traveling" effect. The system comprises a neon glow tube type sequencer with bidirectional capability wherein pulses applied to the sequencer cause the glow tubes to fire in either forward or reverse sequential order to thereby trigger electronic switching means, permitting corresponding sequential energization of the load.

3,710,181

SOLID-STATE IMAGE INTENSIFIER

Kazunobu Tanaka; Yasuhiko Machida; Norio Suzuki, and Tadao Kohashi, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Filed Sept. 22, 1970, Ser. No. 74,334
Int. Cl. H01j 39/00; H05b 37/00
U.S. Cl. 315—175 **9 Claims**



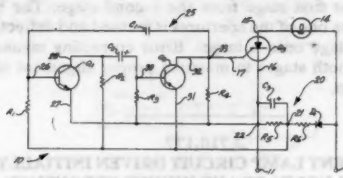
A solid-state image intensifier comprising, essentially, an electroluminescent layer containing 45 to 70 percent by volume of electroluminescent phosphor mixed with a binding material and a photoconductive layer in juxtaposition or close association with the electroluminescent layer. This solid-state image intensifier is adapted for use as an amplifier of radiant energy or as a converter of invisible radiation into visible radiation and is designed to be energized by AC and DC fields. Due to its pecific composition, the electroluminescent layer has a nonlinear resistance which functions to keep a DC voltage applied across the photoconductive layer at a substantially constant value, thereby increasing the photoconductive sensitivity of the photoconductive layer. The increase in the DC voltage as applied to the image intensifier causes the characteristic curve to shift to the low input energy side, enabling efficient operation of the image intensifier in a low input energy range.

3,710,182

CIRCUIT PRODUCING CANDLE-FLICKER LIGHT OUTPUT FROM LAMP

Robert Theodore Van Reenen, 407 South Hollyoak Place, West Covina, Calif.

Filed April 30, 1971, Ser. No. 139,045
Int. Cl. H05b 37/02, 41/14
U.S. Cl. 315—199 **5 Claims**

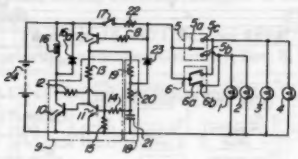


An incandescent lamp and a controllable switch such as a thyristor are connected in series across an alternating-current power line. An oscillator supplies gate pulses to the switch to energize the lamp for substantially randomly varying portions of half cycles of the line current. The lamp produces a constantly varying light output which closely simulates flickering light of a candle.

3,710,183
FLASHER FOR VEHICLES

Yoshichi Kawashima, Gifu-shi, and Hisami Mitsueda, Mie-gun, both of Japan, assignors to Nippon Denso Kabushiki Kaisha, Kariya-shi, Japan

Filed Aug. 4, 1969, Ser. No. 847,023
Claims priority, application Japan, Sept. 12, 1968, 43/65966
Int. Cl. H05b *37/02*
U.S. Cl. 315—209 3 Claims

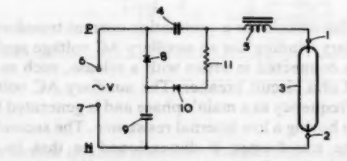


A flasher for vehicles wherein a transistor switching circuit is driven by the output from a transistor adapted to conduct upon closure of a flasher lamp change-over switch or all-lamp (hazard-warning) flasher switch, the output from said switching circuit energizing an exciting coil to close a normally-open contact, and flasher lamps are turned on with a lamp current conducted thereto through said normally-open contact, a resistor and said flasher lamp change-over switch or all-lamp (hazard-warning) flasher switch. The value of said lamp current is then detected by the voltage drop across said resistor which in turn provides a bias voltage between the base and emitter of said transistor, and a current conduction time limiting circuit is further provided for determining the duration of current supply to said flasher lamps by a charging time constant of two resistors and a capacitor such that the operation of said transistor switching circuit is discontinued by the output from said conduction time limiting circuit to de-energize the exciting coil and cause the flasher lamps to go off for a period of time which is determined by the discharging time constant of the one of the two resistors and capacitor in said conduction time limiting circuit. Thus, there is provided a flasher for vehicles wherein not only a direction indicating function, including an ability to indicate occurrence of burnout or breakage (circuit discontinuity) of any one of the flasher lamps, but also a hazard-warning or fault indicating function are realized through a single flasher circuit in which integrated circuits may be readily utilized.

3,710,184
CIRCUIT ARRANGEMENTS FOR OPERATING ELECTRIC DISCHARGE LAMPS

Charles Edington Williams, Stanmore, England, assignor to The General Electric Company Limited, London, England

Filed Oct. 22, 1970, Ser. No. 82,957
Claims priority, application Great Britain, Oct. 30, 1969, 53,305/69
Int. Cl. H05b *37/00*
U.S. Cl. 315—227 10 Claims

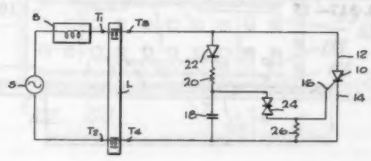


A starting circuit arrangement for an electric discharge lamp has a capacitive ballast connected in series with the lamp terminals and the A.C. supply terminals. A charging circuit, which includes one or more diodes, charges the capacitive ballast to twice (or more than twice) the peak voltage of the supply so that three times (or more than three times) the supply voltage is available to start the lamp. In one embodiment the capacitive ballast is divided into two equal parts, each connected to one lamp terminal and each charged to twice the peak voltage of the supply by an associated diode charging circuit, so that five times the peak voltage of the supply is available across the lamp terminals.

3,710,185
FLASHER CIRCUIT

Henry N. Switsen, 2319 Montrose Drive, Thousand Oaks, Calif.

Filed June 7, 1971, Ser. No. 146,568
Int. Cl. H05b *37/00*
U.S. Cl. 315—240 5 Claims

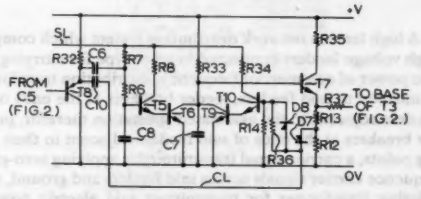


A circuit which can be connected in a fluorescent lamp fixture in place of the starter, to create a bright, psychedelic flashing effect. The circuit includes a silicon controlled rectifier (SCR) that is turned on by a timing circuit once in every several cycles of the A.C. source to clamp the voltage across the fluorescent lamp to a low level so that the lamp cannot light. The timing circuit preferably operates the SCR a minority of the time so that the lamp is on most of the time to provide a high average illumination level, and the timing circuit preferably operates the SCR to turn off the lamp at rate of at least 5 times per second so that the sensed effect is similar to that of a bright light flashed on for a brief time rather than a moderate intensity light that is turned off for a brief time. The timing circuit includes a diode, resistor, and timing capacitor connected in series across the lamp terminals, and a diac or neon tube connected across the capacitor and to the gate of the SCR to discharge the capacitor and turn on the SCR once in every several cycles of the A.C. source.

3,710,186
SIGNAL PROCESSING CIRCUIT

Denis Sharp, East Grinstead, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 12, 1969, Ser. No. 884,551
Claims priority, application Great Britain, Dec. 13, 1968, 59,525/68
Int. Cl. H02p *5/00*; B60t *8/12*
U.S. Cl. 317—5 12 Claims



A vehicle anti-lock brake control system includes a pick-up device that produces electric signals with a frequency proportional to the vehicle wheel speed. These signals are applied via an amplifier to a Frequency-D.C. converter that develops a voltage proportional to wheel speed. A signal processing circuit is responsive to this voltage to produce an output signal when the wheel deceleration rate exceeds a reference deceleration. The output of the signal processing circuit is ap-

plied via a power amplifier to energize a solenoid that initiates an anti-lock braking action. The signal processing circuit will subsequently deenergize the solenoid as a function of a given criterion related to the wheel movement, as determined by the voltage applied thereto from the converter. Possible criteria are that the reference deceleration is no longer exceeded, that the wheel has ceased to decelerate or has started to accelerate.

3,710,187

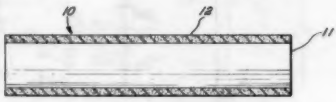
ELECTROMAGNETIC DEVICE HAVING A METAL OXIDE VARISTOR CORE

John D. Harnden, Jr., Schenectady, N.Y., assignor to General Electric Company

Filed Sept. 30, 1971, Ser. No. 185,269

Int. Cl. H02h *7/04*

U.S. Cl. 317—15 **10 Claims**



Electromagnetic devices such as inductors and autotransformers having improved suppression to sparking or high voltage peaks at the terminals and between coil windings are provided using certain sintered metal oxide insulators having varistor characteristics. The metal oxide can be employed in conjunction with magnetic core material, as a composite core in such electromagnetic devices.

3,710,188

HIGH TENSION NETWORK DISTRIBUTION SYSTEM

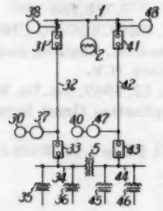
Toshio Oyachi, Takarazuka, Hyogo, Japan, assignor to The Osaka Transformer Co., Ltd., Yodogawa-ku, Osaka, Osaka-Prefecture, Japan

Filed Dec. 6, 1971, Ser. No. 204,861

Claims priority, application Japan, Dec. 7, 1970, 45/107597

Int. Cl. H02h *7/26*

U.S. Cl. 317—26 **6 Claims**



A high tension network distribution system which comprises high voltage feeders connected in a net-type for carrying electric power of commercial frequency, distribution transformers connected to said feeders, feeder breakers at the ends of said feeders adjacent to the associated substation therefor, protector breakers at the ends of said feeders adjacent to their feeding points, a carrier signal transmitter for applying zero-phase-sequence carrier signals across said feeders and ground, an insulating transformer for transmitting said electric power of commercial frequency between adjacent feeders, but not for transmitting said carrier signal between the adjacent feeders, and signal receivers for receiving said zero-phase-sequence carrier signals from the feeders, said protector breakers including relay means for closing the corresponding breaker when the corresponding receiver receives the carrier signal and for opening the breaker when the receiver does not receive the carrier signal.

3,710,189

TIME DELAY SIGNAL DEVICE ESPECIALLY FOR PHASE COMPARISON PROTECTIVE RELAYING SYSTEM

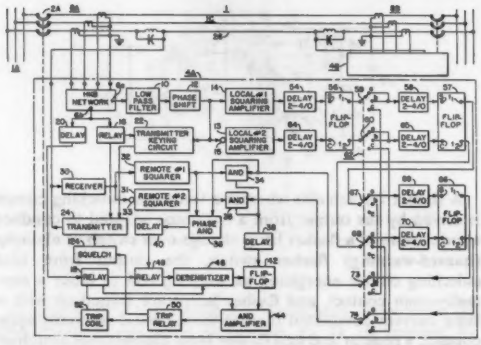
John E. Hagberg, Mountain Lakes, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 51,097, June 30, 1970, Pat. No. 3,612,952.

This application July 22, 1971, Ser. No. 164,998

Int. Cl. H01h *47/18*

U.S. Cl. 317—27 R **12 Claims**



A phase comparison relaying network which permits the delaying of the local signal which responds to the alternating current at the local terminal of the alternating current transmission line for an interval which may be greater than the time interval of 180° of the alternating current whereby to compensate for time delay in the transmission from the remote terminal of the alternating current transmission line to the local terminal a signal responsive to the alternating current at the remote terminal when the time of transmission is greater than the 180° interval.

3,710,190

FAULT CURRENT PROTECTIVE CIRCUIT FOR A LOAD SUPPLIED FROM SINGLE OR POLYPHASE SYSTEMS

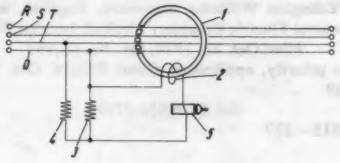
F. Dankward Althoff, Milwaukee, Wis., assignor to Brown Boveri & Cie AG, Mannheim, Germany

Filed Feb. 7, 1972, Ser. No. 223,920

Claims priority, application Germany, Feb. 13, 1971, P 21 06 879.1

Int. Cl. H02h *3/28*

U.S. Cl. 317—18 D **10 Claims**



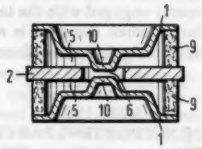
The protective circuit has a summation current transformer whose secondary winding has an auxiliary AC voltage applied thereto and is connected in series with a release, such as the operating coil of a circuit breaker. The auxiliary AC voltage has the same frequency as a main's phase and is generated by a voltage source having a low internal resistance. The secondary winding of the transformer is dimensioned so that its impedance, with the transformer core magnetically unsaturated, is at least of the same order as the impedance of the release, and the internal resistance of the auxiliary voltage source, with the transformer core magnetically saturated, is low relative to these impedances. The auxiliary voltage source may be part of a voltage divider connected between one phase and either a

neutral conductor or another main, and the voltage divider may comprise a condenser and a resistance. The release may be designed as a relay which is pre-polarized by an electromagnet excited by rectification from the same phase as the auxiliary AC voltage. Various additional circuit modifications may be made.

3,710,191
OVERVOLTAGE ARRESTER WITH SEVERAL ELECTRODES

Gerhard Peche, Berlin, Germany, assignor to Siemens Aktiengesellschaft

Filed Oct. 15, 1971, Ser. No. 189,677
Claims priority, application Germany, Dec. 8, 1970, P 20 60 388.7
Int. Cl. H02h 9/04
U.S. Cl. 317—62 **10 Claims**

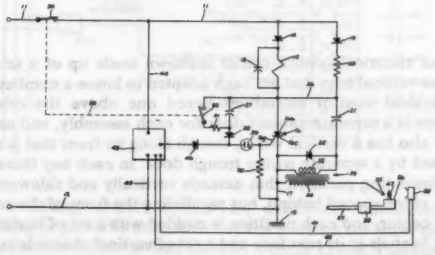


In order to avoid transverse voltages between associated conductor pairs without additional deflectors, particularly in the case of symmetrical wiring of telecommunication lines with overvoltage arresters, a gas discharge lightning arrester is proposed comprising two principal electrodes and one secondary electrode, as well as a ground electrode located symmetrically with respect to the principal electrodes, the ground electrode together with the two principal electrodes forming two principal discharge paths whose response for which is higher than that of a secondary discharge path defined by the principal electrodes.

3,710,192
BURNER IGNITION SYSTEM

Stanley J. Budlane, Fulton, Ill., assignor to General Electric Company

Filed June 18, 1971, Ser. No. 154,429
Int. Cl. F23g 3/00
U.S. Cl. 317—96 **8 Claims**

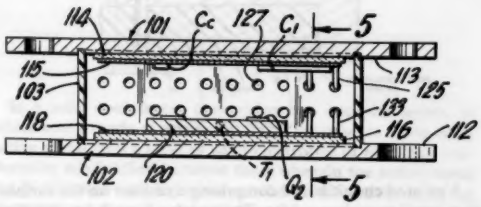


A burner ignition system for connection to a source of alternating current electric energy. The system has a spark generator, including an ignition transformer. The primary of ignition transformer is connected to a controlled rectifier. The trigger circuit for the controlled rectifier includes a series arrangement of a rectifier, a capacitance and a voltage breakdown device.

3,710,193
HYBRID REGULATED POWER SUPPLY HAVING INDIVIDUAL HEAT SINKS FOR HEAT GENERATIVE AND HEAT SENSITIVE COMPONENTS

Sol Greenberg, Roslyn; Robert D. Gold, Saint James, and Richard J. Projain, Syosset, all of N.Y., assignors to Lambda Electronics Corporation, Huntington, N.Y.

Filed March 4, 1971, Ser. No. 121,063
Int. Cl. H02b 1/00
U.S. Cl. 317—100 **24 Claims**

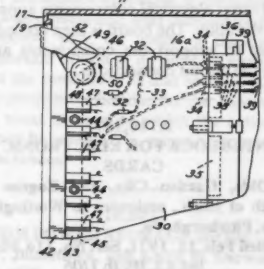


An electronic power supply unit wherein a power transistor generative of undesired heat is carried by a first heat conductive plate spaced from a second heat conductive plate by a tubular shell of low thermal conductivity to form an enclosure. An integrated control circuit is carried by the second plate and connections are made to the power transistor and control circuit via connectors external to the enclosure.

3,710,194
CONCEALED ADJUSTABLE ELEMENT FOR ELECTRONIC CIRCUIT CARDS

Frank X. Zammit, Birmingham, and Anthony G. Schad, Sterling Hts., both of Mich., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 11, 1971, Ser. No. 114,507
Int. Cl. H02b 1/04
U.S. Cl. 317—101 R **9 Claims**

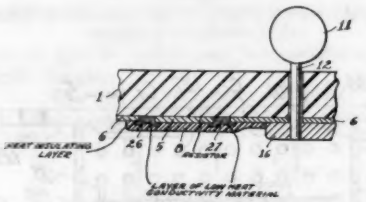


An electronic circuit card having a panel positioned along the front edge of the card to conceal an adjustable circuit element mounted on the card directly behind the panel. A movable actuator for adjusting the element is positioned to be manually accessible by inserting one's finger over the top edge of the panel.

3,710,195
PRINTED CIRCUIT BOARD HAVING A THERMALLY INSULATED RESISTOR

Tomohiko Sada; Noriyuki Tsuchiya; Tameo Amamiya; Yoko Kaneda, and Kazuyuki Ohta, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 12, 1971, Ser. No. 114,960
Claims priority, application Japan, Feb. 14, 1970, 45/12885
Int. Cl. H02b 1/04
U.S. Cl. 317—101 C 2 Claims

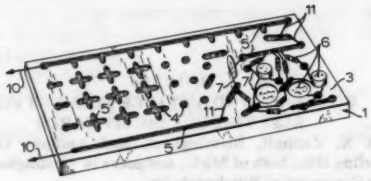


A printed circuit board comprising a resistor on the surface that receives molten solder. The resistor has a heat shielding layer on it and may also have connections of low heat conductivity material to the conductive circuit on the board.

3,710,196
CIRCUIT BOARD AND METHOD OF MAKING CIRCUIT CONNECTIONS

Thomas B. Fifield, 1535 West Dean Road, Milwaukee, Wis.

Filed April 27, 1970, Ser. No. 32,024
Int. Cl. H05k 1/18
U.S. Cl. 317—101 CC 7 Claims



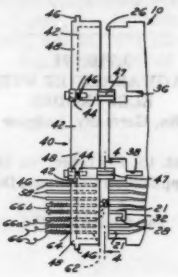
The top surface of a circuit board made of a dielectric material is provided with a plurality of recesses filled with mercury or a low melting point conductive alloy. The alloy is solid at room temperature and reduced to a plastic or flow condition at a temperature below the damaging temperature of the board. The board is heated to maintain the low melting point alloy in its liquid state and the component leads of the electronic and other electrical components appropriately bent to extend into the alloy. The board is then cooled such that the solder solidifies to support the components and simultaneously establish the circuit connections.

3,710,197
POWER INTERLOCK FOR ELECTRONIC CIRCUIT CARDS

Richard G. Olds, Garden City, and Eugene P. Bonzack, Livonia, both of Mich., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 11, 1971, Ser. No. 114,505
Int. Cl. H02b 1/06
U.S. Cl. 317—118 5 Claims

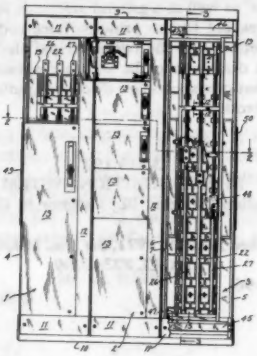
An electronic circuit card having a plurality of aligned terminals which are engageable with corresponding terminals in a terminal block. The construction of a particular terminal on the card is such that it is the last terminal on the card to make contact with a terminal in the terminal block when the card is inserted into the block. This particular terminal on the card is electrically connected to another terminal on the card. The card and the terminal block are constructed such that power to the circuit components on the card can be supplied only through these two terminals when the card is fully inserted into the block. This arrangement prevents power from being applied to the components on the card until all the terminals on the card are properly engaged with the terminals in the terminal block. Similarly, when the card is removed from the block the power circuit is the first to be disconnected.



3,710,198
CONDUCTOR SUPPORTING PARTITION FOR ELECTRICAL CONTROL CENTER

Lawrence A. Burton, Oconomowoc, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Jan. 6, 1971, Ser. No. 104,327
Int. Cl. H02b 1/14
U.S. Cl. 317—120 15 Claims



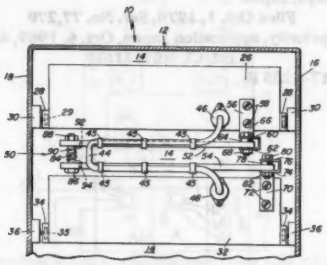
An electrical control center is shown made up of a set of three vertical bays that are each adapted to house a number of individual control assemblies tiered one above the other. There is a separate cabinet door for each assembly, and each bay also has a vertical wiring trough along its front that is enclosed by a separate wiring trough door. In each bay there is an insulating partition that extends vertically and sidewardly in a plane spaced behind, but paralleling the front of the control center, and each partition is molded with a set of horizontal channels in its rear face and a set of vertical channels in its front face. Three power distributing buses fit snugly within the horizontal channels of the rear faces of the partitions, and extend from bay to bay to conduct electrical power throughout the control center. A set of power distributing feeder buses fit within the vertical channels of each partition, and connections are provided which secure each feeder bus with a main bus in a manner that holds the main buses, feeder buses and insulating partition of a bay in a tight assembly, with the partition sandwiched between the main and feeder buses.

3,710,199

INTERCHASSIS CABLE CARRIER

Edward P. Cignoni, Jr., Norwood, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 9, 1971, Ser. No. 178,869
Int. Cl. H02b 1/20
U.S. Cl. 317—122 8 Claims



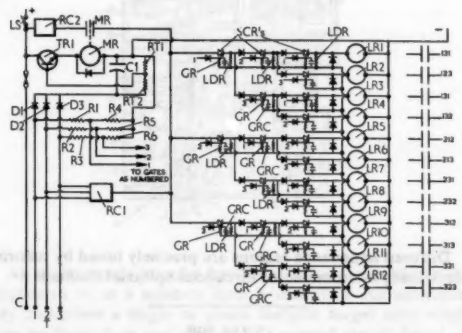
An electrical console comprising a cabinet having a pair of spaced parallel assemblies slidably supported therein to move in and out of the cabinet independently of one another, a cable carrier disposed between the assemblies and including a pair of hinged arms each of which has a respective end portion pivotally attached to a respective one of the assemblies, and an electrical cable having opposing ends each of which is attached to a respective one of the assemblies and having an intermediate length secured to the arms of the cable carrier.

3,710,200

SWITCHING CONTROL SYSTEMS

Robert Henry Jones, 17 Marsha Drive, Agincourt, Ontario, Canada

Filed June 16, 1970, Ser. No. 46,601
Claims priority, application Great Britain, June 18, 1969, 30,827/69
Int. Cl. H01h 47/32; E05b 49/00
U.S. Cl. 317—134 7 Claims



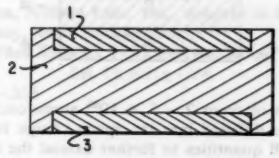
A switching control system for selectively controlling switching of power to utilization devices in which the latter are connected to control switch units by a cable having a smaller number of conductors than the number of utilization devices, each control switch unit having a number of contacts equal to the number of conductors less one. The system also includes a circuit selector unit connected to the cable and including a decoding means for determining the sequence of contact operation in a control switch unit and for controlling power supply to a selected utilization device, the number of the latter being substantially greater than the number of cable conductors.

3,710,201

COULOMETER WITH SOLID ELECTROLYTE

Hironosuke Ikeda, and Tetsuya Kondo, both of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka-fu, Japan

Filed Feb. 4, 1971, Ser. No. 112,757
Claims priority, application Japan, Feb. 4, 1970, 45/10172
Int. Cl. H01g 9/00
U.S. Cl. 317—230 4 Claims



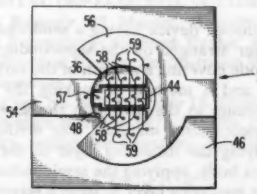
In a solid coulometer comprising two opposite layers, of which one is made of active metal and the other is made of inactive metal, and a layer of solid electrolyte of high iron conductivity sandwiched between them wherein the active metal ion is migrated and deposited on the inactive metal layer on charging and then the deposited active metal ion is removed from the inactive metal layer and re-depodited on the active metal layer on discharging so that an over-voltage is produced at the completion of the re-deposition, an improvement where the opposite metal layers are buried in the solid electrolyte layer, the opposite surface area of each of the opposite metal layers being smaller than the surface area of the solid electrolyte layer contacting thereto.

3,710,202

HIGH FREQUENCY POWER TRANSISTOR SUPPORT

Arthur John Leidich, and Max Edward Malchow, both of Flemington, N.J., assignor to RCA Crop.

Filed Sept. 9, 1970, Ser. No. 70,632
Int. Cl. H01l 5/00
U.S. Cl. 317—234 R 4 Claims



A support for transistors operating at high frequencies includes an electrically insulating, heat conductive base member having a conductive pad, on which a transistor may be mounted, on a portion of one of its surfaces and a conductive ground plane on the remainder of that surface. An apertured, insulating plate member is bonded to the base member and has conducting areas thereon to which the active regions of the transistor may be coupled in a manner characterized by low parasitic reactances.

3,710,203

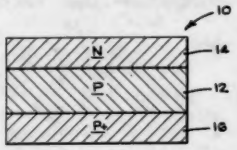
HIGH POWER STORAGE DIODE

Donald F. Stahr, Johnstown, and Kirby D. Dorwachter, Monroeville, both of Pa., assignors to FMC Corporation, San Jose, Calif.

Filed Nov. 5, 1971, Ser. No. 196,078
Int. Cl. H01l 3/00
U.S. Cl. 317—234 R 8 Claims

A high power storage silicon diode of the type having a lightly doped P-type base region or central layer of approximately 100 microns or more in width with a resistivity of about 90 ohm-centimeters and with one heavily doped end layer of

N-type material and with another heavily doped end layer of P-type material. The boron in the P-type layer should have an average concentration of at least 2×10^{20} atoms/cm.^{3} while the phosphorous in the N-type layer should have an average



concentration of from $2 - 5 \times 10^{20}$ atoms/cm.^{3}. Atoms of nickel can be diffused into the space charge region of the diode in small quantities to further extend the storage time without degrading the other useful qualities of the device.

3,710,204

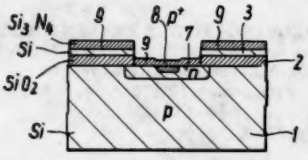
SEMICONDUCTOR DEVICE HAVING A SCREEN ELECTRODE OF INTRINSIC SEMICONDUCTOR MATERIAL

Monika Batz, Heilbronn/Neckar, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm/Donau, Germany

Continuation of Ser. No. 730,097, May 17, 1968, abandoned. This application April 16, 1971, Ser. No. 134,877

Int. Cl. H01 *11/00, 15/00*

U.S. Cl. 317—235 R **9 Claims**



A semiconductor device having a semiconductor body, an insulating layer arranged on the semiconductor body and a screen electrode covering a portion of the surface of the insulating layer, and a method of making the semiconductor device. According to the invention the screen electrode is made of semiconductor material. The method includes the steps of applying the insulating layer to the surface of the semiconductor body, applying the semiconductor layer to the surface of the insulating layer to form a screen electrode and etching a diffusion window through the semiconductor layer and the insulating layer to expose the surface of the semiconductor body.

3,710,205

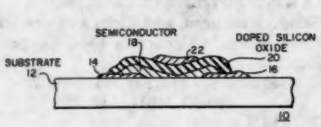
ELECTRONIC COMPONENTS HAVING IMPROVED IONIC STABILITY

John G. Swanson, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed April 9, 1971, Ser. No. 132,643

Int. Cl. H01 *11/14, 1/10*

U.S. Cl. 317—234 R **6 Claims**



This disclosure is concerned with electronic components having improved ionic stability. The improved stability is achieved by the doping of silicon oxide films and layers in the component. Suitable doping materials are selected from a group of material having divalent large ionic radii atoms.

3,710,206

NEGATIVE IMPEDANCE SEMICONDUCTOR DEVICE WITH MULTIPLE STABLE REGIONS

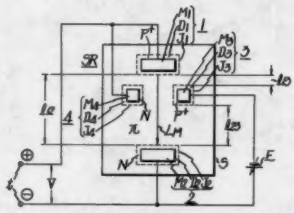
Takeshi Matsushita, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 1, 1970, Ser. No. 77,270

Claims priority, application Japan, Oct. 6, 1969, 44/79788

Int. Cl. H01 *11/08*

U.S. Cl. 317—235 R **2 Claims**



An electrical circuit utilizing a semiconductor device to provide a novel negative impedance characteristic. The semiconductor device has, for example, four independent high impurity concentration regions formed on a semiconductor substrate, two of which regions inject carriers of opposite polarities into said substrate and another two of which regions are applied voltages so that junctions formed between said substrate and themselves are reversely biased to establish the desired negative impedance characteristics.

3,710,207

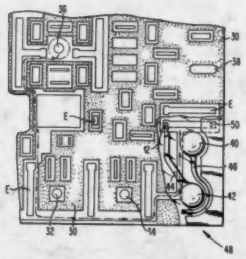
POSITIONAL DEPENDENCY MONOLITHIC IMPEDANCE

Majid Ghafghaichi, Poughkeepsie, N.Y., and Daniel Tuman, Beacon, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed March 30, 1971, Ser. No. 129,418

Int. Cl. H01 *19/00*

U.S. Cl. 317—235 R **3 Claims**



Diffused impedance regions are precisely tuned by tailoring electrically interconnected circuitous epitaxial channels.

3,710,208

SEMICONDUCTOR OSCILLATING ELEMENT AND CONTROL CIRCUIT THEREFOR

Masaya Yabe; Teizo Takahama; Masaru Kono, and Katsumi Hirono, all of Kawasaki, Japan, assignors to Fuji Denki Seizo Kabushiki Kaisha, Kanagawa-ken, Japan

Filed April 6, 1971, Ser. No. 131,694

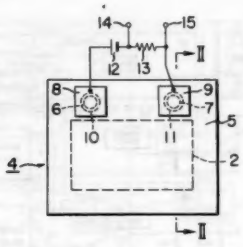
Claims priority, application Japan, April 7, 1970, 45/29518; April 7, 1970, 45/29519; April 7, 1970, 45/29520; April 7, 1970, 45/29521

Int. Cl. H01 *5/00, 11/10*

U.S. Cl. 317—235 **12 Claims**

A novel semiconductor oscillating element comprising: a semiconductor wafer provided with a region of a first conduc-

tivity type, a region of a second conductivity type opposite to said first conductivity type, and a pn junction formed between said two regions; a minority carrier injection means provided on the region of said first conductivity type at a specific distance from the region of said second conductivity type; and electrodes provided on the region of said first conductivity



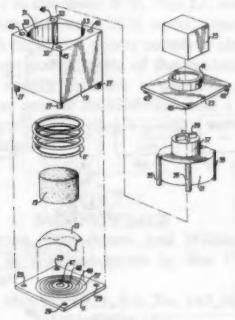
type at specific distances respectively from said carrier injection means and from said region of said second conductivity type; said element being adapted for a device generating an oscillating voltage on an oscillating current, or a device converting a physical quantity into oscillating frequency.

Various modifications of the semiconductor oscillating element mentioned above are disclosed also.

3,710,209
VARIABLE CAPACITOR

James R. Webb, and Richard C. Webb, both of Boulder, Colo., assignors to Colorado Instruments, Inc., Bloomfield, Colo.

Continuation-in-part of Ser. No. 13,091, Feb. 20, 1970, Pat. No. 3,653,038. This application Aug. 13, 1971, Ser. No. 171,640
Int. Cl. H01g 5/16
U.S. Cl. 317—249 R **15 Claims**

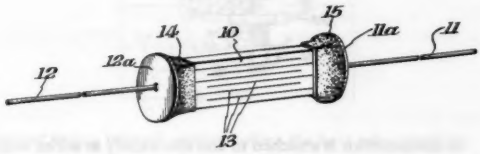


An electrostatic impulse key suitable for use in electronic keyboards or as a separate item is described. An individual key comprises a single or plural metallic target area which may be formed on one surface of a printed circuit board. A dome spring is mounted above the metallic target and a foam cylinder is mounted between the dome spring and an actuator element. The actuator element is operated by a key mechanically connected thereto. In addition, a coil spring located about the foam cylinder between the printed circuit board and the actuator is provided for loading the actuator and key to a predetermined level prior to actuation (depression) of the key. When the key is depressed, the actuator presses the foam cylinder against the upper surface of the dome spring to cause the dome spring to change position. This position change changes the separation distance between the dome spring and the metallic target in a rapid or "snap action" manner. Because the separation distance is changed, the capacitance between the dome spring and the metallic target increases to cause a rapid decrease in a voltage connected between the dome spring and the target. This voltage decrease is in the form of a signal pulse and is suitable for use in electronic keyboard subsystems.

3,710,210
ELECTRICAL COMPONENT HAVING AN ATTACHED LEAD ASSEMBLY

John B. Heron, Wichita Falls, Tex., assignor to Sprague Electric Company, North Adams, Mass.

Filed April 13, 1972, Ser. No. 243,677
Int. Cl. H01g 1/14
U.S. Cl. 317—258 **7 Claims**

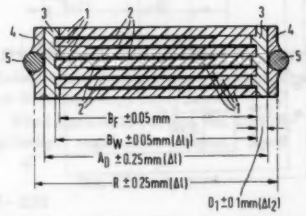


A ceramic chip capacitor is dipped in conductive termination paint so that there is a complete band of the conductive material all the way around the end of the chip and on the end surface. Leads having a nailhead type end that has larger overall dimensions than the end of the chip are soldered to the conductive end termination of the chip. A solder fillet forms all the way around the chip to the nailhead lead and extends over the edge of the chip producing a mechanical saddle all around the chip that provides an advantageously strong bond therewith.

3,710,211
FRONT CONTACTED ELECTRICAL COMPONENT

Reinhard Behn, Balanstr. 95, Munich; Heinrich Gottlob, Annahofstr. 25, Regensburg; Gerhard Hoyler, Balanstr. 362, Munich, and Hartmut Kessler, Dechbettener Str. 19, Regensburg, all of Germany

Continuation of Ser. No. 841,860, July 15, 1969, abandoned. This application March 8, 1971, Ser. No. 122,206
Claims priority, application Germany, July 24, 1968, P 17 64 717.5
Int. Cl. H01g 1/14
U.S. Cl. 317—261 **1 Claim**



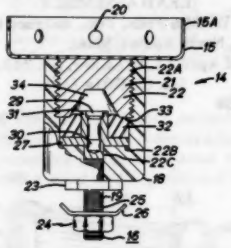
A pile or layer condensor is provided with external connecting wires on its two frontal sides by pressing the connecting wires into an outer metallic layer which has a lower melting point than an inner metallic layer which contacts the plates of the condensor. The connecting wires are thereby embraced by the outer layer and adhere to the inner layer.

3,710,212

DISCONNECTOR FOR SURGE ARRESTERS

James R. Marek, South Milwaukee, and Stanley S. Kershaw, Jr., Greendale, both of Wis., assignors to McGraw-Edison Company, Milwaukee, Wis.

Filed July 29, 1971, Ser. No. 167,214
Int. Cl. H02h 9/06
U.S. Cl. 317—66 14 Claims



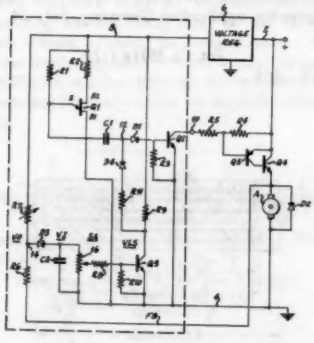
A disconnector is attached to and electrically in series with a surge arrester. The disconnector has a breakable shell that is broken by explosion of a cartridge within the shell when excessive current flows across an arcing gap. The disconnector has a top electrode and a bottom electrode with the top electrode connected to the surge arrester and the bottom electrode connectable to a connector wire. An annular electrically conductive elastomer gasket is compressed between the upper and lower electrode to provide a high resistance current path around the arcing gap and also to seal the cartridge from the outside atmosphere.

3,710,213

PULSE RATE CONTROL MOTOR SPEED CONTROL SYSTEM WITH FEEDBACK

James E. Hansen, Oak Creek, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Feb. 22, 1971, Ser. No. 117,399
Int. Cl. H02p 5/16
U.S. Cl. 318—331 10 Claims



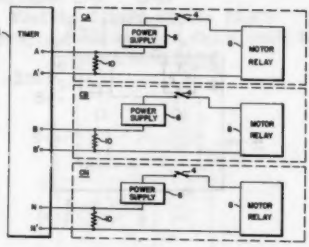
A control system of the feedback type especially adapted for controlling the speed of a D.C. motor such as a permanent magnet field motor or a shunt wound motor. A solid state pulse generator provides constant width D.C. pulses for controlling the "on" time of the motor. A feedback signal from the motor is applied to the solid state pulse generator to control the "off" time of the motor to afford pulse rate control for speed regulation.

3,710,214

PLURAL MOTOR TIMING SEQUENCE SYSTEM

Wallace G. Anderson, 981 Route 23, Wayne, N.J.

Filed May 4, 1971, Ser. No. 140,217
Int. Cl. H02p 1/58
U.S. Cl. 318—102 11 Claims



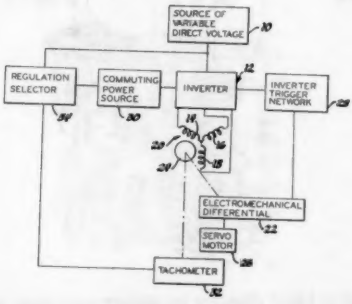
A system for starting a plurality of motors sequentially, which operates in such a manner that each motor will not start until the previously started motor has come to full speed and acquires normal current flow. The timing sequence system hereof is connected in the control circuit of the motors associated with the system and is thereby not subject to the high voltage and current requirements which characterize the motor power circuit.

3,710,215

PROGRAMMED COMMUTING POWER SOURCE FOR INVERTER MOTOR SYSTEM

Richard W. Johnston, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 1, 1970, Ser. No. 42,336
Int. Cl. H02p ; H02m 7/52
U.S. Cl. 318—227 6 Claims

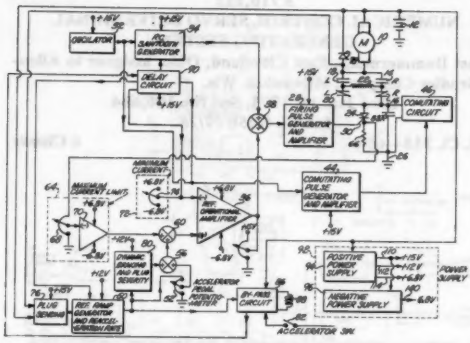


An inverter for supplying alternating current to an electrical load, such as an AC induction motor, from a direct current source. The inverter of this system includes a plurality of power controlled rectifiers which are gated conductive by a trigger logic network to provide alternating current to the electrical load. Commutation circuits comprised of community power sources, commuting capacitors, and commuting controlled rectifiers provide a means for turning-off or commutating the power controlled rectifiers. A control means is provided which regulates the output voltage of the commuting power sources inversely with the voltage level of the main direct current source. Additionally, when the inverter is used to power an AC induction motor, the output voltage of the commuting power sources is further regulated as a function of the speed of rotation of the rotor of the motor under control.

3,710,216
SCR MOTOR SPEED CONTROL WITH PLUG SENSING CIRCUIT

Aubrey H. Smith, Kenosha, Wis., assignor to Eaton Corporation

Filed April 6, 1971, Ser. No. 131,624
Int. Cl. H02p 3/10, 5/16
U.S. Cl. 318—373 14 Claims



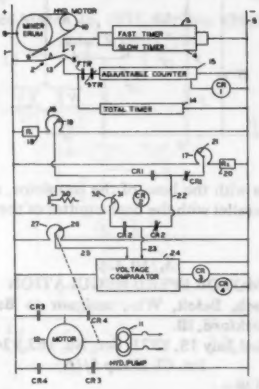
A control system for controlling energy directed from a power source to a DC variable speed motor includes a main SCR, series connected with the motor, an oscillator, a sawtooth generator, a reference operational amplifier, and a firing pulse generator. The output of the sawtooth generator is summed with the output of the reference operational amplifier and directed to the firing pulse generator. When the summed output of the reference operational amplifier and the sawtooth generator exceeds the threshold voltage of the firing pulse generator, the firing pulse generator will fire to effect conduction of the main SCR to direct energy to the motor. A commutating circuit is provided for turning the main SCR off during each cycle of the oscillator. The commutating circuit includes a secondary SCR and a LC resonant circuit both of which are parallel connected to the main SCR. The LC resonant circuit acts to reverse bias the main SCR upon conduction of the secondary SCR. A regulated power supply is also provided to energize the various components of the control system. The regulated power supply includes a negative power supply which comprises an astable multivibrator and a diode-capacitor matrix for directly converting a positive voltage to a regulated negative voltage.

3,710,217
MIXING TIMER

Norman L. Peterson, Wauwatosa, and William H. Buelow, Brookfield, all of Wis., assignors to Rex Chainbelt Inc., Milwaukee, Wis.

Filed May 27, 1971, Ser. No. 147,352
Int. Cl. H02p 1/04
U.S. Cl. 318—470 4 Claims

A control for a transit-mix truck is arranged to indicate for each revolution of the mixer drum, whether the drum speed is below a predetermined minimum or above a predetermined maximum speed, to count those revolutions occuring at speeds between the predetermined speeds, and to initiate a change from mixing to a slower agitating speed when a predetermined number of counted revolutions are recorded. In a preferred structure a pair of slow drop out timing relays and a control relay are briefly energized at least once each revolution of the mixer drum. Contacts on the relays are arranged such that a first capacitor is charged immediately following the brief energization of the relays and is discharged through an indicating light if the next relay energization occurs before the expiration of a first timing interval. The relay contacts are also arranged such that a second capacitor is charged at the expiration of the first timing interval and is discharged through a counter in the event the relays are energized prior to the expiration of a second timing interval or is discharged through a second indicating light in the event the

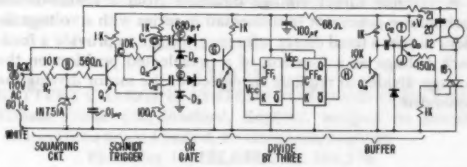


second timing interval expires before the next relay energization.

3,710,218
INDUCTION MOTOR SPEED CONTROL

Carlos B. Roundy, Stanford; John B. Riddle, Los Altos Hills, and Ralph M. Heintz, Los Gatos, all of Calif., assignors to Micro-Magnetic Industries, Inc.

Filed Oct. 8, 1970, Ser. No. 79,140
Int. Cl. H02p 5/34; H03b 19/00
U.S. Cl. 318—231 19 Claims



The speed of an AC induction motor is controlled by regulating the frequency of the voltage applied to the stator. An improved frequency conversion circuit reduces the power line frequency to a lower desired frequency. The aforesaid induction speed control is suitable for use in any process or plant requiring the control of an AC induction motor, and is particularly useful in a pre-pay gasoline dispensing pump control system where a reduction in the pumping rate is required.

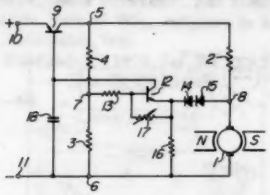
3,710,219
SPEED CONTROL SYSTEM FOR DC MOTORS

Tadashi Takahashi, and Kazuo Onishi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed April 6, 1970, Ser. No. 25,979
Claims priority, application Japan, April 11, 1969, 44/27658
Int. Cl. H02p 5/16
U.S. Cl. 318—331 5 Claims

A speed control system for a DC motor comprising a bridge circuit including a first resistor connected in series with an armature, a second and a third resistor connected in series with each other and in parallel with the first series resistor circuit, whereby the amount of bias voltage provided between the detection terminals of the bridge circuit is applied to the base-emitter of a transistor in differential relationship with a reference voltage to thereby control the feed voltage of the bridge circuit in accordance with the collector current of the

transistor, characterized by the provision of a resistor connected in series with the base of the transistor, and a resistor connected in parallel with the base-emitter of the transistor.



3,710,220

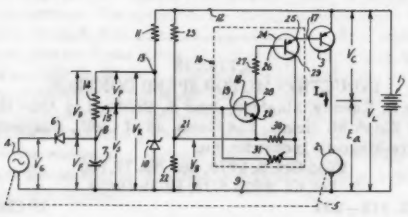
MOTOR SPEED REGULATION

A. Richard Koch, Beloit, Wis., assignor to Barber-Colman Company, Rockford, Ill.

Filed July 15, 1971, Ser. No. 162,924

Int. Cl. H02p *5/16*

U.S. Cl. 318—328 **9 Claims**



A variable direct voltage obtained from a motor-driven tachometer generator is connected in series with a voltage divider across a fixed direct reference voltage to provide a feedback voltage as a function of a preselected position on the voltage divider to regulate the speed of the motor driving the generator.

3,710,221

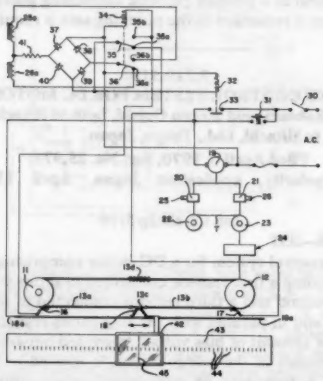
APPARATUS FOR POSITIONING FILM OR TAPE WOUND ON REELS

Lyle Gilbert Priest, Palo Alto, Calif., assignor to Information Design, Inc.

Filed June 25, 1971, Ser. No. 156,660

Int. Cl. G05b *1/06*

U.S. Cl. 318—467 **7 Claims**



A switching mechanism including a sliding contact and a pair of movable contacts which control a motor used to drive a film or tape between two reels. A mechanical feedback positions the movable contacts in relationship to linear displacement of the film or tape in accordance with the set position of the sliding contact. An analog computer mechanism comprising a pair of spiral pulleys linearizes the feedback relative to film or tape displacement.

3,710,222

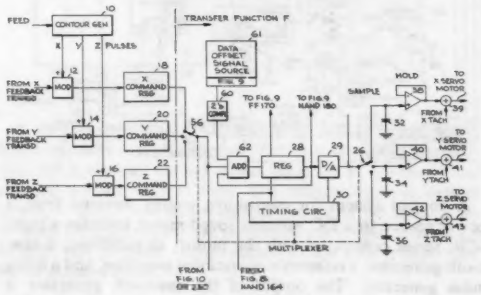
NUMERICAL CONTROL SERVO DRIVE SIGNAL GENERATING SYSTEM

Ernst Dummermuth, East Cleveland, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Jan. 15, 1971, Ser. No. 106,684

Int. Cl. G05b *19/28*

U.S. Cl. 318—604 **6 Claims**



In a numerical control system the following error or distance to the end point is expressed as a binary number. This binary number is inspected and if above a certain value an offset number is added in order to obtain a desired transfer characteristic from digital to analog converter to which the digital number is to be applied. This new binary number is converted into an analog voltage which is used to drive the servo motor of a numerical control, point to point, or contouring, system. Depending upon the magnitude of the binary number to be converted, the digital to analog converter is switched between different resolutions to generate a smooth dynamic response and to provide high gain for small binary numbers.

3,710,223

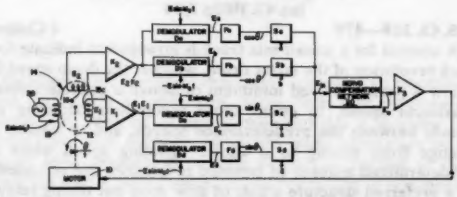
POSITION CONTROL SYSTEM RESOLVER

George B. Cottrell, Cerritos, Calif., assignor to North American Rockwell Corporation

Continuation of Ser. No. 14,405, Feb. 26, 1970, abandoned. This application Aug. 27, 1971, Ser. No. 175,744

Int. Cl. G05b *1/06*

U.S. Cl. 318—661 **7 Claims**

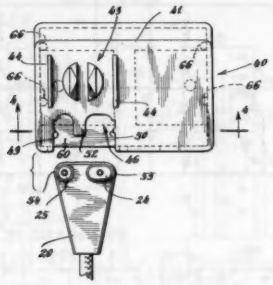


A position control system is provided to position a rotatable shaft coupled to a servomotor controlled sequentially by individual ones of a phase ordered group of feedback signals supplied by a resolver also coupled to said shaft. Logic circuitry provides steering signals for sequential gating of said feedback signals at a rate corresponding to the desired angular velocity of the shaft. The invention herein described was made in the course of or under a contract or subcontract thereunder, with the Air Force.

3,710,224
DISPLAY STAND FOR RECHARGEABLE BATTERY OPERATED APPLIANCE

John F. Daniels, Bridgeport, Conn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,072
Int. Cl. H01m 45/04
U.S. Cl. 320—2 6 Claims

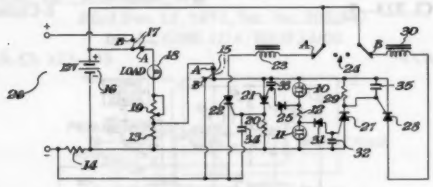


A stand for supporting a rechargeable battery operated appliance in a stationary position when the batteries are being recharged which includes a casing upon which the appliance is mounted and a power cord connected to a source of external replenishing power for recharging the batteries. Means are provided on the casing and the power cord for detachably securing a plug portion of the cord to the casing and means are provided on the plug portion of the cord for supporting the appliance in a stationary position on the stand when the cord is attached to the casing.

3,710,225
BATTERY OPERATING SYSTEM TIMED BY COULOMETERS

Robert W. Herzig, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed March 20, 1972, Ser. No. 235,998
Int. Cl. H02j 7/00
U.S. Cl. 320—9 7 Claims



A battery circuit having a drain coulometer and a charge coulometer connected in series so as to alternately plate and deplate and being alternately connectible in parallel with one of a pair of current sensing resistors in series with the battery, each of which accurately reflects the current condition of the battery circuit over a period of time. The drain coulometer integrates a proportional charge current.

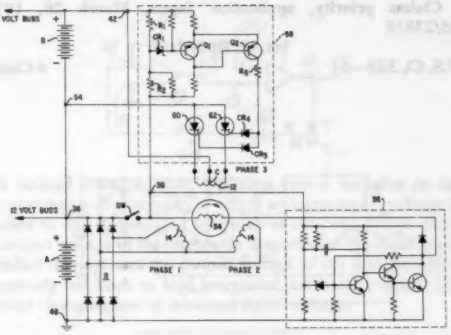
Thus during the drain mode of the battery, when a predetermined amount will be removed from the drain coulometer and deposited in the charge coulometer. At a critical depletion of coulombs the drain monitor undergoes an impedance transformation which triggers a gate mechanism to actuate switching of the battery to the charge mode.

In the charge mode the charge coulometer undergoes the critical coulomb depletion leading to an impedance transformation which in turn triggers a further gate mechanism for actuating switching of the battery back to the drain mode.

3,710,226
GENERATOR WITH MULTIPLE VOLTAGE REGULATORS

Helmut K. Seike, Toledo, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed March 25, 1971, Ser. No. 128,027
Int. Cl. H02j 7/14
U.S. Cl. 320—15 3 Claims

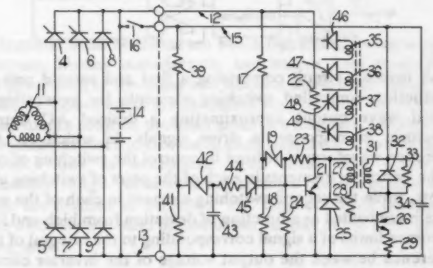


A solid-state series regulator is disclosed which controls the output of one phase of a multiple output three-phase alternator, whose remaining two phases have their output controlled by a solid-state regulator which varies the current to a rotating field exciting the alternator. The alternator is preferably used to charge two standard batteries, the main battery being charged by the two cooperating phases of the alternator whose output is controlled by the regulator for the field, while the auxiliary battery is charged by the third separate phase regulated by the solid-state series regulator. The two batteries are connected in series and connected to loads requiring different voltages.

3,710,227
BATTERY CHARGING SYSTEMS FOR ROAD VEHICLES

William Frank Hill, Stafford, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed May 18, 1971, Ser. No. 144,578
Claims priority, application Great Britain, June 13, 1970, 28,745/70
Int. Cl. H02p 7/06, 9/30
U.S. Cl. 320—59 3 Claims



A battery charging system for a road vehicle has a three phase permanent magnet alternator for charging the battery through a full wave rectifier. Thyristors are associated with the full wave rectifier for controlling the supply of power from the alternator to the battery, conduction of the thyristors being determined by a voltage regulator coupled to the battery. The rectifier consists of four thyristors and two diodes, the two diodes being associated with one phase of the alternator and the four thyristors being associated with the other two phases of the alternator. If a voltage surge occurs as a result of the

battery being disconnected, then means operate to ensure that gate current is removed from the thyristors to ensure that the thyristors turn off.

3,710,228

BATTERY CHARGING ARRANGEMENT

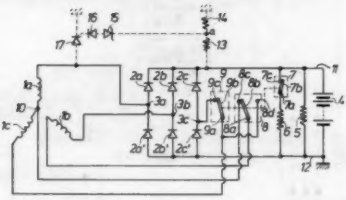
Toshimitsu Higashino, Banchi, Japan, assignor to Nippondenso Kabushiki Kaisha, Aichi ken Japan

Filed March 19, 1971, Ser. No. 125,947

Claims priority, application Japan, March 20, 1970, 45/23835

Int. Cl. H02j 7/14

U.S. Cl. 320—61 **4 Claims**



A three-phase generator charges a battery under high and low load conditions through a bridge rectifier. The windings of the A.C. generator are connected in a Y connection when the system under high load and in series when the system is under low load.

3,710,229

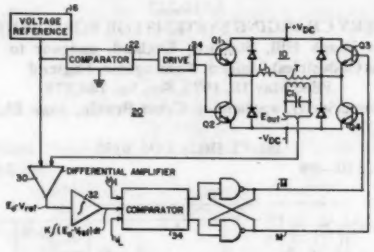
INTEGRATOR CONTROLLED INVERTER

Ralph D. Jessee, Lima, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 11, 1971, Ser. No. 152,115

Int. Cl. H02m 1/12

U.S. Cl. 321—9 A **5 Claims**



An inverter circuit comprising a first and second pair of conduction controlled switching elements for generating a pulsed wave output approximating a desired AC output waveform in response to drive signals, in which an AC reference waveform is utilized to control the switching of one of the switching elements in each of the pairs of switching elements, while the second switching element in each of the said pairs is controlled as a function of deviation from high and low reference limits of a signal corresponding to the integral of the difference between the output voltage of the inverter circuit and the AC reference waveform.

3,710,230

COMMUTATION CIRCUIT FOR POWER INVERTERS

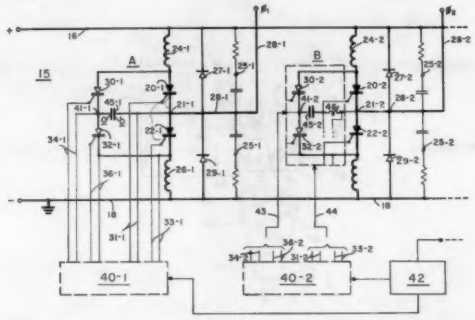
Dan L. VeNard, II, Bonners Ferry, Idaho, assignor to Gates Learjet Corporation, Wichita, Kansas

Continuation of Ser. No. 868,191, Oct. 21, 1969, abandoned. This application Aug. 13, 1971, Ser. No. 171,754

Int. Cl. H02m 7/48

U.S. Cl. 321—45 C **3 Claims**

Circuit provides positive cut-off of a silicon controlled rectifier from its firing state, in rapid response to a logic pulse or signal. An individual commutation circuit is utilized for each power SCR or leg of an inverter system. Inexpensive, with relatively few electrical components for each such circuit. Simple in its operation, has substantially no internal or trapped energy losses. Commutation cut-off periods or hold-off times of the order of 15 microseconds are readily attained. A single commutating condenser is used for a pair or opposed



power SCR^S. An inductor is arranged in series with both the power and the commutating SCR of each inverter leg, to the D.C. bus, affording substantially lower dV/dt and dI/dt impact thereon. In essence, a rapid yet "soft" commutation function is provided herein, whereby commercially available SCR^S can be used for most power systems, over longer life periods. The circuit is adaptable for commutating SCR^S in wide range of applications.

3,710,231

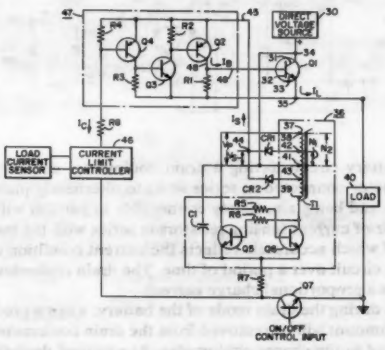
D.C. STATIC SWITCH INCLUDING MEANS TO SUPPRESS TRANSIENT SPIKES BETWEEN A DRIVE SOURCE AND THE SWITCH ELEMENT

Donal E. Baker, Lima, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 15, 1971, Ser. No. 124,310

Int. Cl. G05f 1/58

U.S. Cl. 323—9 **6 Claims**



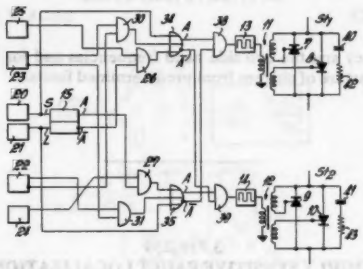
A low voltage drop, D.C. static switch with improved controllability for current limiting is provided wherein the transient spikes from a drive source such as a free running, core-timed oscillator are suppressed by one or more static amplifier stages before the drive signal is supplied to the power switch element. A current limit controller can be isolated from the transient spike source. Such switches have good characteristics for remote power controllers.

3,710,232

LOGIC-CONTROLLED THYRISTOR SYSTEM FOR PERFORMING TAP-CHANGING OPERATIONS

Manfred Matzl, Dr-Weiss-Strasse 23, 693 Eberbach/Neckar, Germany

Filed Jan. 21, 1972, Ser. No. 219,706
Claims priority, application Germany, Jan. 29, 1971, P 21 04 075.5
Int. Cl. G05f
U.S. Cl. 323—43.5 S 5 Claims



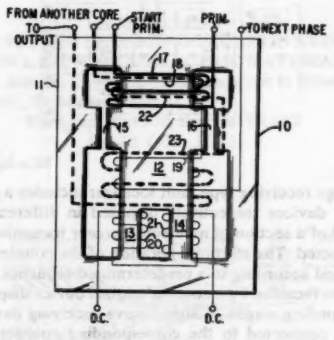
A system for performing tap-changing operations on tapped regulating transformers by thyristor networks and relatively movable contact means. The trigger pulse generators for the thyristors of the networks are controlled by sensors whose output is fed into a logic circuitry. The sensors include a pair of sensors responsive to the position of current-carrying contacts, a pair of sensors responsive to the position of disconnect contacts and a pair of sensors responsive to the voltage across a thyristor network.

3,710,233

POLYPHASE SATURABLE POWER MODULATOR

Henry S. Borkovitz, Skokie, Ill., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed Dec. 15, 1971, Ser. No. 208,347
Int. Cl. G05f 1/14; H01f 33/00
U.S. Cl. 323—45 4 Claims



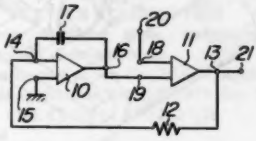
A three-phase delta zig-zag connected system having high leakage reactance cores with magnetic air gap shunts and with aiding and bucking secondary windings, the bucking windings being controlled by d.c. saturation. The aiding and bucking windings are divided between different phase cores.

3,710,234

VOLTAGE CHANGING RATE DETECTING CIRCUIT

Yoshiaki Nakano, Gifu-shi, Japan, assignor to Nippondenso Kabushiki Kaisha, Aichi-ken, Japan

Filed Feb. 18, 1971, Ser. No. 116,344
Claims priority, application Japan, Feb. 23, 1970, 45/15459
Int. Cl. G01r 19/12
U.S. Cl. 323—100 5 Claims



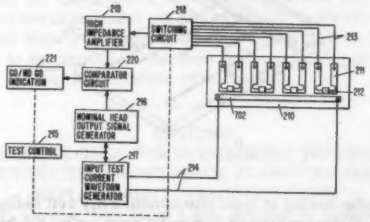
A voltage changing rate detecting circuit includes an integrator and a comparator, in which an input signal voltage is applied to one of the input terminals of the comparator while an output voltage of the integrator is applied to the other input terminal thereof, and the output voltage of the comparator is negatively fed back to said integrator, to thereby detect the voltage changing rate of the input signal voltage.

3,710,235

METHOD AND APPARATUS FOR TESTING BATCH FABRICATED MAGNETIC HEADS DURING MANUFACTURE UTILIZING A MAGNETIC FIELD GENERATED BY A CURRENT CARRYING CONDUCTOR

Stephen M. Barrager, Palo Alto, Calif., and Sidney H. Smith, Broomfield, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 4, 1971, Ser. No. 149,975
Int. Cl. G01r 35/00
U.S. Cl. 324—34 R 10 Claims



Magnetic head elements are batch fabricated on areas of a substrate. During manufacture, and before final separation and processing of the areas into discrete multi-track magnetic heads, defective areas are identified for removal. An electric signal source subjects the head areas to a magnetic field which is detected as electric current in each head area. The detected current value in acceptable head areas falls within a predefined range. All head areas having a current outside the range are defined as defective. The magnetic field emanates from a conductive strip placed in the vicinity of the head areas being tested.

3,710,236

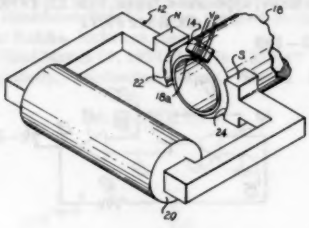
MAGNETIC LEAKAGE FIELD FLAW DETECTOR UTILIZING PARTIALLY OVERLAPPING HALL PROBES

Homer P. Halsey, and John F. Halsse, III, both of c/o Youngstown Sheet and Tube Company, P.O. Box 900, Youngstown, Ohio

Filed Nov. 30, 1970, Ser. No. 93,546
Int. Cl. G01g 33/12
U.S. Cl. 324—37 6 Claims

Method and apparatus for detecting flaws in non-destructive testing of material having a longitudinal extent, e.g., in

welds of butt-welded pipe, through the use of a flux energizer having magnetic poles adapted to impart flux to said material in a path transverse to said extent, and a pair of flux sensors. The flux sensors comprise a pair of overlaying Hall generator



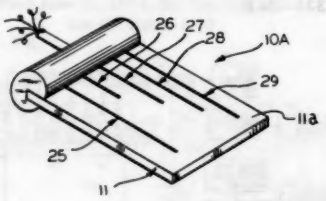
devices arranged so that a line extending between the voltage lead connection points of one device is parallel to a corresponding line of the other device and to a line transverse to the ambient flux path.

3,710,237

PROBE FOR A CONDUCTIVITY TESTING DEVICE

William R. Watson, Oak Lawn, and James J. Moran, Matteson, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Sept. 8, 1970, Ser. No. 70,323
Int. Cl. G01n *27/42*
U.S. Cl. 324—30 R **2 Claims**



A probe having at least one conductivity cell defined by a pair of electrodes formed as printed circuitry on a substrate of insulting material such as a printed circuit board. The probe is adapted to be immersed in the solution to be measured, and may or may not include a thermistor on the substrate to compensate for variation in solution temperature. The exposed area of the electrodes and the distance therebetween can be accurately and precisely controlled to provide consistent cell constants in probe manufacture.

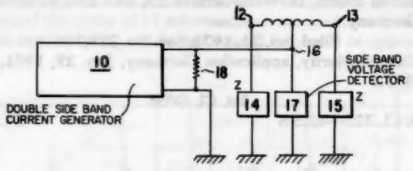
3,710,238

SENSITIVE SOUND FAULT METER AND DETECTOR UTILIZING A DOUBLE SIDE BAND FREQUENCY CURRENT-GENERATOR

Wesley G. Peterson, Mount Prospect, Ill., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed April 27, 1971, Ser. No. 137,814
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 **6 Claims**

An electrical leakage detector indicating hazard level, for use in hospitals or the like, using a constant current generator having at least two side band frequencies on either side of the line frequency with a high impedance return to the ground from the constant current generator, together with a discriminator means to distinguish between the power line



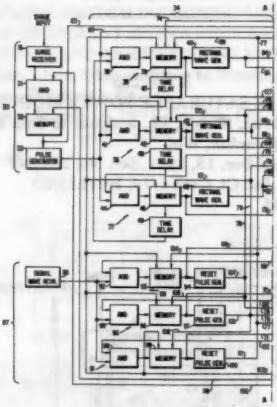
frequency and the two side band frequencies and for indicating departure of current from predetermined limits.

3,710,239

HIGHLY SENSITIVE FAULT LOCALIZATION APPARATUS CAPABLE OF LOCATING MULTIPLE FAULTS ALONG A SECTION OF AN ELECTRIC POWER TRANSMISSION LINE

Takeshi Nakamura, Tokyo-to, Japan, assignor to Tokyo Shibaura Electric Company, Ltd., Kawasaki-shi, Japan

Filed April 2, 1971, Ser. No. 130,710
Claims priority, application Japan, April 8, 1970, 45/29558
Int. Cl. G01r *31/08*
U.S. Cl. 324—52 **8 Claims**



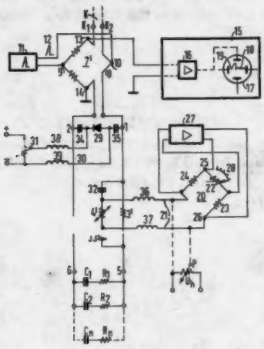
A surge receiving type fault localizer includes a plurality of counter devices respectively disposed in different stages at one end of a section of an electric power transmission line to be inspected. The starting operation of the counter devices is controlled according to a predetermined sequence every time a surge is received by a counter control device disposed in the corresponding stages. A signal wave receiving device having outputs connected to the corresponding counter devices is provided for stopping a counting operation every time a signal is received from the other end of the section. Thus, the counter devices operate cyclically in turn every time a surge is received and the most recent content of the counter devices is read out by the operation of a relay device which is provided for protecting the section from an internal fault.

3,710,240

CIRCUIT ARRANGEMENT FOR THE DETECTION OF FAULTS OR POINTS ON INHOMOGENEOUS ELECTRIC LINES OR CABLES ACCORDING TO THE IMPULSE REFLECTION METHOD UTILIZING AN ADJUSTABLE BALANCING NETWORK

Karl Kuehnemann, Munich, and Josef Turban, Ebenhausen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Feb. 1, 1971, Ser. No. 111,373
Claims priority, application Germany, Feb. 3, 1970, P 20 04 848.0
Int. Cl. G01r 31/08, 17/02
U.S. Cl. 324—52 13 Claims



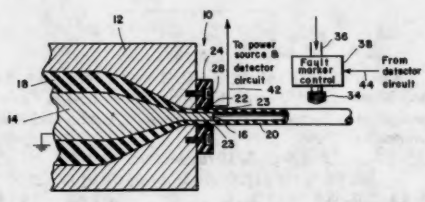
A circuit arrangement for the detection of faulty or inhomogeneous points on electrical lines or cables, according to the impulse-reflection method, in which test impulses are applied to the line input over a bridge circuit and the reflecting impulse components are evaluated as to their magnitude and/or transit time; in an evaluation device which is arranged at the output side of the bridge circuit, the bridge circuit being adapted to be balanced by means of an adjustable balancing network in which there is disposed a variable ohmic resistance which is constructed in the form of an electrically-controlled resistance to which is connected a control circuit for effecting the adjustment thereof and adapted to have the resistance thereof varied by a control circuit employing a direct current or a low frequency alternating current bridge which contains a manually controllable element for effecting the desired resistance change. An electrically controlled capacitance may also be provided for the balancing of reactive components.

3,710,241

APPARATUS FOR DETECTING FAULTS IN EXTRUDED INSULATING OR DIELECTRIC MATERIAL

William R. Dineen, Tallmadge, Ohio, assignor to Dineen Enterprises, Inc., Tallmadge, Ohio

Filed Sept. 8, 1970, Ser. No. 70,412
Int. Cl. G01r 31/12
U.S. Cl. 324—54 6 Claims



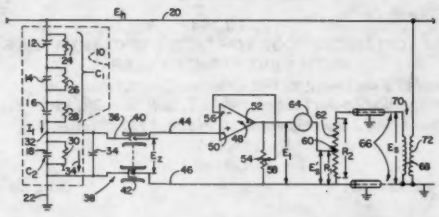
Disclosed is a method of detecting faults or discontinuities in the insulating or dielectric properties of an extruded tube. A high voltage potential is established between a ring which surrounds the tube as it emerges from the extrusion die and the extrusion core. Any conduction between the ring and the core unbalances a bridge network which then activates a relay to indicate the presence of a fault or discontinuity. A die or paint sprayer or a warning device may also be controlled by the relay to mark the location of the fault or defect.

3,710,242

SERVICE BUSHING TEST

Edmund H. Povey, Medford, Mass., assignor to Doble Engineering Company, Belmont, Mass.

Continuation-in-part of Ser. No. 26,541, April 8, 1970, abandoned. This application Feb. 12, 1971, Ser. No. 114,780
Int. Cl. G01r 31/12, 27/26
U.S. Cl. 324—54 19 Claims



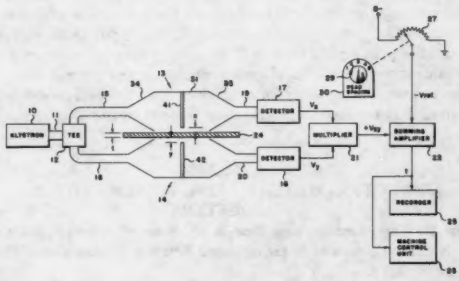
Apparatus for measuring a defect characteristic of a bushing which has a high voltage electrode passing through a grounded flange, insulating material around the electrode and a capacitance tap, while the bushing is in service connected to a high voltage source, includes an impedor connected permanently between the capacitance tap of the bushing and ground. The impedance of this impedor is so low relative to the impedance of the insulating material of the bushing between the capacitance tap and ground that the voltage between the capacitance tap and ground does not exceed one hundred volts. A pluggable connection permits an external circuit to be coupled to the impedor for providing an indication of a defect characteristic of the bushing.

3,710,243

MICROWAVE GAGE FOR MONITORING THICKNESS OF A CONDUCTIVE WORKPIECE, FLAWS THEREIN OR DISPLACEMENT RELATIVE THERETO

Peter P. Keenan, Van Nuys, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Aug. 18, 1971, Ser. No. 172,768
Int. Cl. G01r 27/04
U.S. Cl. 324—58.5 B 7 Claims



A microwave induction gage for inspecting a conductive workpiece such as conductive sheet material wherein microwave energy is fed to a gaging head having a conductive plate member coupling microwave energy onto the surface of

the workpiece to be inspected. A waveguide window formed by the spacing between the conductive sheet material and a fin secured to said plate member and arranged transverse to the direction of energy propagation in the head area passes microwave energy, the amplitude of which varies as an exponential function of the spacing, whereby detection and measurement of the amplitude of the energy passing the window provides an indication of the magnitude of the spacing. The plate member is grooved to guide energy through the coupler head area. Also, a fin may be fitted longitudinally in the groove to aid mode stability.

By employing two of the conductive plate members, one on either side of the workpiece so as to form a pair of spaced energy paths, the amplitude of the energy passing the windows may be detected and multiplied to provide an indication of the thickness of the workpiece with inherent compensation for lateral displacement.

3,710,244

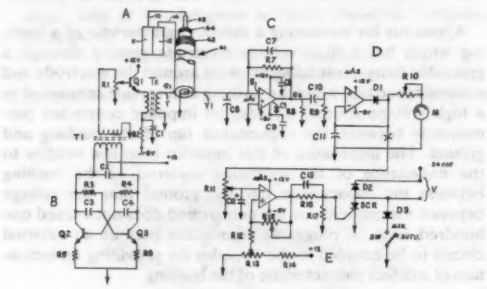
CAPACITANCE PROBE FOR DETECTING MOISTURE WITH VERY LONG CABLES

George P. Rauchwerger, 147 Cromart Court, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 777,219, Nov. 20, 1968, Pat. No. 3,626,286. This application Jan. 11, 1971, Ser. No. 105,254

Int. Cl. G01r 27/26

U.S. Cl. 324—61 R **7 Claims**



A probe consists of two spaced elements, each consisting of a piece of foil, sheet, rod or tube, each insulated from the other and from the material whose moisture is to be measured. The elements are connected by two coaxial or one tri-axial cable to a remote piece of electronic equipment including an ultrasonic oscillator which transmits signals to the probes, which thus function as a variable capacitor, the variation being dependent on the moisture content of the said material in which the probes are imbedded. The equipment has a preamplifier (integrated circuit charge amplifier) having high frequency response and very low voltage differential between the two inputs. An integrated circuit peak detector provides a positive D.C. voltage proportional to the input peak voltage from the preamplifier. Such D.C. voltage may be measured by a microammeter to indicate moisture, or the output may be used to control a valve (for irrigation, e.g.) Several probes and valves may be used in an irrigation system, or the like.

3,710,245

INDUCTION METER HAVING POWER-FACTOR-ADJUSTER

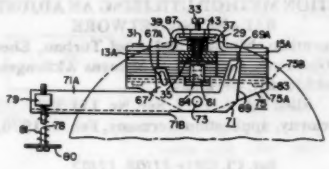
Joe D. Clay, Lenoir, and Joseph M. Keever, Raleigh, both of N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 22, 1971, Ser. No. 126,638

Int. Cl. G01r 11/22

U.S. Cl. 324—138 **5 Claims**

The voltage winding of an induction meter directs voltage magnetic fluxes through a first path including the armature of the meter and a second path spaced from the armature. An adjustable power-factor control is responsive to flux in the



second path. A fixed power-factor control is responsive to flux in the first path and restrains the adjustable control against improper movement.

3,710,246

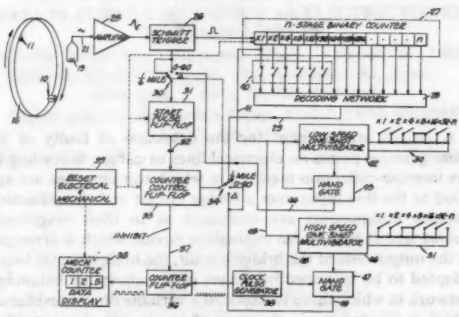
AUTOMOBILE TIMER

Carl E. Herring, 1021 Sixth Street, Santa Monica, Calif.

Filed June 22, 1970, Ser. No. 48,282

Int. Cl. G01p 3/42

U.S. Cl. 324—162 **6 Claims**



Magnet markers are secured to a vehicle front wheel, and immediately adjacent thereto, secured to the body of the vehicle, there is located a coil sensor. Signals induced in the sensing coil are shaped and fed into an *n*-stage binary counter. The decoded binary counter output conditions switching logic which interrelates a clock pulse generator and a counter having digital display. Three modes of operation are provided: elapsed time for a quarter mile; acceleration time over a predetermined speed range; and acceleration time from a standing start to a given speed.

The present application pertains to apparatus for making velocity-time measurements, and, more particularly, to apparatus for use with wheeled vehicles to measure time extent between selective vehicle velocities and for predetermined distances of travel.

3,710,247

CABLE TERMINAL FOR HIGH VOLTAGE CABLES

Claus Kessler, and Werner Kohler, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

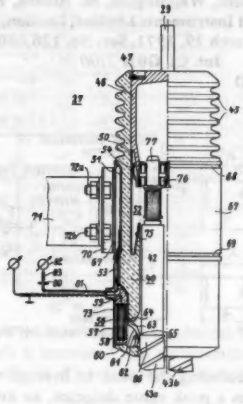
Filed Sept. 8, 1970, Ser. No. 70,047

Int. Cl. G01r 31/00; H02g 3/00; H01d 17/00

U.S. Cl. 324—96 **9 Claims**

A circuit device electrically connects a bus bar to a high voltage cable core of a cable terminal. The cable terminal has an insulating body for supporting the cable core relative to

ground. A voltage transformer is structurally combined with



the cable terminal and has a dielectric comprising part of the insulating body of the cable terminal.

3,710,248

MEASUREMENTS WITH DIGITAL VOLTMETERS

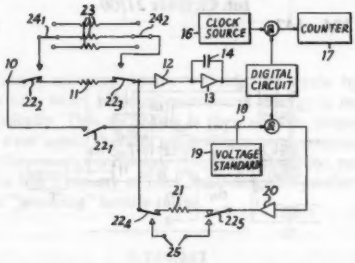
John Bloomfield, Farnborough, England, assignor to The Solatron Electronic Group Ltd., Farnborough, Hampshire, England

Filed Sept. 23, 1970, Ser. No. 74,725

Claims priority, application Great Britain, Sept. 26, 1969, 47,483/69

Int. Cl. G01r *17/06, 27/02*

U.S. Cl. 324—99 D 4 Claims



A digital voltmeter is adapted for measuring resistance by switching an internal reference voltage to the voltmeter input and switching the feedback resistor out of circuit. The unknown resistor is connected in place thereof. For measuring current the input resistor is removed from the input circuit.

3,710,249

SLIDEBACK PEAK CIRCUITS WITH CONSTANT TONE INDICATIONS

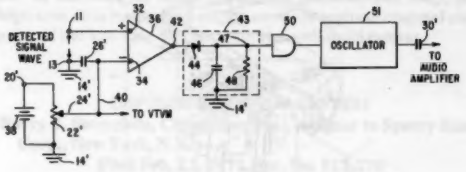
Nicholas M. Kadar, Los Angeles, Calif., assignor to The Singer Company, New York, N.Y.

Filed May 6, 1971, Ser. No. 140,804

Int. Cl. G01r *19/16, 17/02*

U.S. Cl. 324—103 P 5 Claims

A peak detector measuring apparatus having an audio output tone which is abruptly cut-off when a DC voltage is manually adjusted to be equal to the peak value of an input signal voltage wave. The apparatus is suitable to measure the peak value of unmodulated signals, amplitude modulated



signals, and pulse modulated signals having relatively narrow pulse widths and relatively low repetition rates.

3,710,250

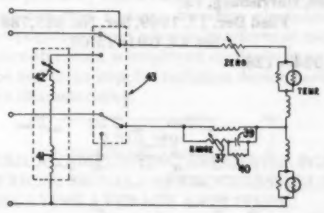
DYNAMOMETER INDICATOR SYSTEM

Stanley Keith Chesterton, Jr., North Wales, and William J. Samph, Quakertown, both of Pa., assignors to Ametek, Inc., New York, N.Y.

Filed May 6, 1970, Ser. No. 35,211

Int. Cl. G01r *15/08, 1/20*

U.S. Cl. 324—115 4 Claims



A dynamometer indicator instrument has a closed magnetic ring having an arcuate pole member within the ring connected to the inner periphery of the ring by a shank portion. A field coil surrounds the shank portion, and an armature coil encircles the arcuate pole member and is pivotally mounted at the center of curvature thereof. An indicator pointer moves in response to movement of the armature. The instrument is provided with electrical circuit means for self testing of the instrument as desired and an electrical circuit for zero and range adjustment.

3,710,251

MICROELECTRIC HEAT EXCHANGER PEDESTAL

John K. Hagge, Kiganjo, Kenya, and Frederick W. Johnson, Cedar Rapids, Iowa, assignors to Collins Radio Company, Dallas, Tex.

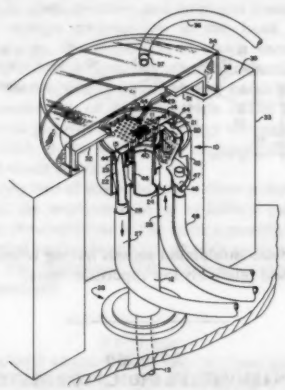
Filed April 7, 1971, Ser. No. 132,031

Int. Cl. G01r *35/00*

U.S. Cl. 324—158 F 8 Claims

A microelectric wafer or chip vacuum chuck in the form of a heat exchanger pedestal with a heat exchanger pressure vessel at the pedestal top through which hot and cold fluids are selectively pumped in circulation from and return to, respectively, hot and cold remote fluid reservoirs. A plurality of small diameter vacuum tubes pierce the heat exchanger pressure vessel and are brazed at each end to upper and lower plates with the top of the upper plate being the chuck surface with the vacuum tubes providing frequent tension ties between the plates. Dry nitrogen is fed into and through a circumferential passageway about the pedestal to protect wafers

and chips with an inert cover atmosphere from oxidation



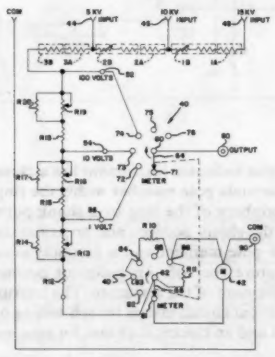
damage at high temperatures or frost damage at low temperatures.

3,710,252

HIGH VOLTAGE DIVIDER UNIT

James Peter Till, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 17, 1969, Ser. No. 885,788
Int. Cl. G01r *15/08*
U.S. Cl. 324—126 **4 Claims**



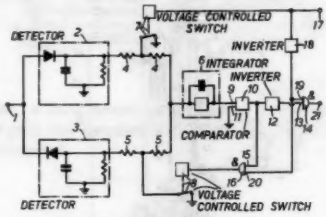
A resistive voltage divider instrument is disclosed which permits very accurate measurements to be taken of the potential of high voltage DC sources, with low DC current drain, by means of a sensitive low voltage differential voltmeter. This voltage divider embodies an instrument packaging concept that utilizes a special insulation system to enclose resistor strings formed of precision wire wound high voltage resistors. The resulting insulated resistor modules are interconnected and positioned within a molded plastic case in such a manner as to minimize all voltage gradients between resistor modules and the ground plane. Special provisions are made for preventing the formation of corona and for minimizing the effects of leakage current errors. Each resistor module contains a series connected string of accurately matched wire wound precision resistors and is filled with an insulating material that is highly resistant to the passage of leakage currents through its volume or across its surface. All interconnections between modules and the connections to the input voltage terminals located at the back of the instrument case are made with special connector and lead assemblies that are resistant to high voltage corona and that provide a quick disconnect feature.

3,710,253

PERFORMANCE CHECKING AND MEASURING DEVICES AND METHODS FOR SIGNAL CHANNELS

Damer Evelyn O'Neill, Waddington, St. Albans, England, assignor to Marconi Instruments Limited, London, England

Filed March 29, 1971, Ser. No. 128,680
Int. Cl. G01r *7/00*
U.S. Cl. 324—140 D **8 Claims**



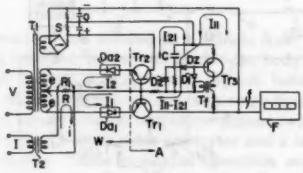
A method of measuring the peak to average value of an A.C. signal includes a peak value detector, an average value detector and a timing waveform source. During alternate half-waves of the timing waveform output from one of the detectors is integrated and during the other half-wave, output from the other detector is integrated, the lengths of the periods for which each detector output is integrated being a function of the two integrated voltages. An output pulsed waveform is produced, the average value of which is representative of the relation between the integrating periods and the duration of a half-wave of the timing waveform.

3,710,254

DIODE WATTHOURMETER

Shoji Kusui, Soka, Japan, assignor to Nihon Denki Keiki Kenteisho, Tokyo-to, Japan

Filed Feb. 1, 1971, Ser. No. 111,448
Claims priority, application Japan, Feb. 9, 1970, 45/10651
Int. Cl. G01r *21/00*
U.S. Cl. 324—142 **2 Claims**



A diode watthourmeter in which square-law rectifying circuits are provided wherein a plurality of diodes are connected in series and resistors properly branched at points connecting said diodes are provided, the forward voltages of the diodes successively added being used for the power detection of a sum and difference square-law system, and further difference output current of the power detecting circuit being converted into a pulse to be counted.

3,710,255

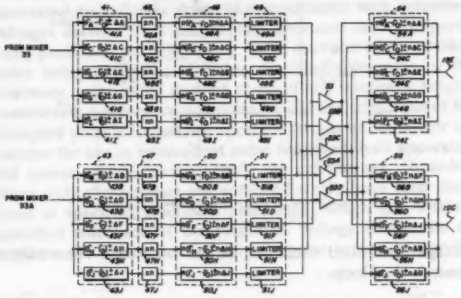
SATELLITE COMMUNICATION SYSTEM

Francis A. Gicca, Bedford, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed March 21, 1969, Ser. No. 809,175
Int. Cl. G01v *3/16*
U.S. Cl. 325—4 **9 Claims**

An improved communication system using an active transponder to relay microwave signals from any one of a number of transmitting stations to selected groups of receiving stations. In a preferred system the active transponder is installed

in a satellite spacecraft and is arranged to convert a number of signals, in closely spaced channels, from the transmitting sta-



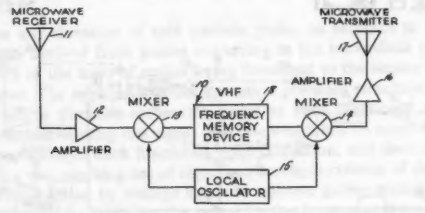
tions in such a manner that the bandwidth of each one of the relayed signals is increased and retransmitted without suffering from the effects of interchannel modulation.

3,710,256

MICROWAVE FREQUENCY MEMORY DEVICE

Melvin A. Lewis, Ringwood, N.J., assignor to Loral Corporation, Scarsdale, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,333
Int. Cl. H04b 7/14
U.S. Cl. 325—6 **3 Claims**



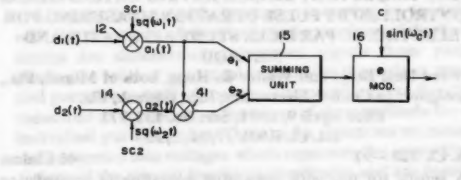
A frequency memory device wherein the cycle by cycle waveform of a short pulse of microwave energy is recorded electro-optically. This recording is then read or played back over and over again thereby achieving a semi-continuous "-tone" at the exact microwave frequency that was received. The device has a variety of uses, including the production of signals for "jamming" hostile radar.

3,710,257

MULTICHANNEL TELEMETRY SYSTEM

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of; Stanley Butman, and Uzi Timor, both of Pasadena, Calif.

Filed March 17, 1971, Ser. No. 125,234
Int. Cl. H04j 9/00
U.S. Cl. 325—60 **21 Claims**



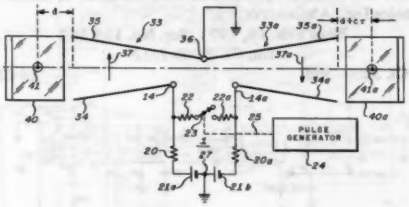
A two-channel telemetry system is disclosed in which one channel is used for high-rate data and the other channel for low-rate data communication. In the transmitter a signal, which subsequently phase modulates a carrier, is produced which is a function of at least the high-rate data, the low-rate data and the frequency of the subcarrier of the low-rate channel. In the receiver which includes a phase-locked loop, the high-rate data is detected off the receiver inphase channel output and the low-rate off the quadrature channel output.

3,710,258

IMPULSE RADIATOR SYSTEM

Harry F. Strenglein, Clearwater, Fla., assignor to Sperry Rand Corp., New York, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,270
Int. Cl. H04b 1/04
U.S. Cl. 325—105 **13 Claims**



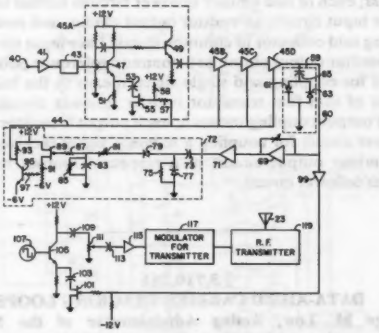
A transmission line system having a primarily signal-initiating section and primarily signal-radiating section, along all of which transmission line sections traveling electromagnetic waves may propogate without adverse interference caused by impedance discontinuities, is employed cyclically as an energy storage device and as an impulse radiation device having spacially directive characteristics.

3,710,259

ELECTRICAL AMPLIFYING APPARATUS FOR ELECTRICAL SIGNALS OF PROGRESSIVELY DECAYING AVERAGE AMPLITUDE

Robert A. Kirby, Houston, Tex., and Billy J. Propst, Houston, Tex., assignors to Esso Production Research Company, Houston, Tex.

Filed Nov. 27, 1970, Ser. No. 92,962
Int. Cl. H04b 1/04, 1/00
U.S. Cl. 325—187 **2 Claims**



A buoy for use in seismic surveying at marine locations comprises an elongated housing with a flotation member positioned near the normal waterline of the device. The lower portion of the housing or battery section is of greater diameter than the upper section, and a tethering ring for connection to an anchor is located at the upper end of the battery section so that the cross sectional area below the tethering ring is substantially equal to the cross sectional area of the housing above the tethering ring. A seismic detection apparatus, con-

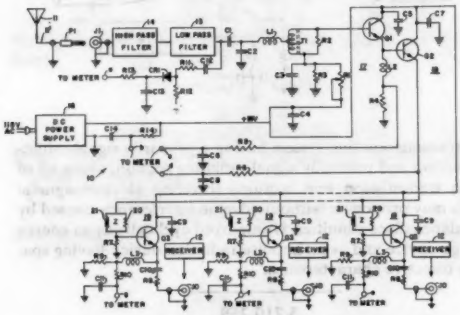
veniently a hydrophone, is used to detect seismic signals and preferably rests on the water bottom. A seismic amplifier within the housing amplifies the geophone signals. The gain of the amplifier is controlled by a circuit that varies the gain in accordance with a weighted function of the amplitude of the output signals of the amplifier over an interval of at least two minutes. The output signal of the amplifier also is used to amplitude modulate a signal generator of constant frequency or constant repetition rate, and the amplitude modulated signal is used to frequency modulate a radio transmitter.

3,710,260

SOLID STATE RECEIVING MULTICOUPLER

Charles S. Wright, Springfield, Va., assignor to Delta Electronics Inc., Alexandria, Va.

Filed Feb. 16, 1971, Ser. No. 115,162
Int. Cl. H04b 1/12
U.S. Cl. 325—308 **10 Claims**



A solid state receiving multicoupler for providing a plurality of output signals from a single signal source comprising in combination a first transistor emitter follower circuit, a second transistor emitter follower circuit connected in cascade with said first transistor emitter follower circuit and a plurality of parallel output transistor emitter follower circuits connected in cascade with said second transistor emitter follower circuit; each of said transistor emitter follower circuits including a single transistor having a base, a collector, and an emitter; each of said emitter follower circuits further including a base input circuit, an emitter output circuit, and means connecting said collector in common to said base input circuit and said emitter output circuit at a common reference point, input means for coupling said single signal means to the base input circuit of said first transistor emitter follower circuit, and a signal output coupling means in each output transistor emitter follower circuit for coupling a separate signal receiver across the emitter output circuit of a respective output transistor emitter follower circuit.

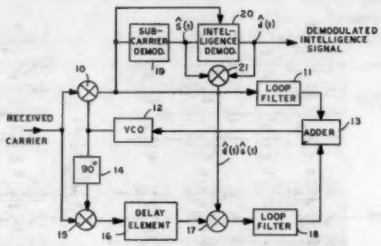
3,710,261

DATA-AIDED CARRIER TRACKING LOOPS

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of; William C. Lindsey, and Marvin K. Simon, both of Pasadena, Calif.

Filed Dec. 24, 1970, Ser. No. 101,354
Int. Cl. H04b 1/26
U.S. Cl. 325—346 **6 Claims**

The loop signal-to-noise ratio is improved in a phase-locked loop used for tracking a carrier in an angle (phase or frequency) modulated communications system by a quadrature channel added to the phase-locked loop. A d-c signal derived from the quadrature channel is added to the signal fed back to the



voltage controlled oscillator in the otherwise conventional phase-locked loop.

ERRATUM

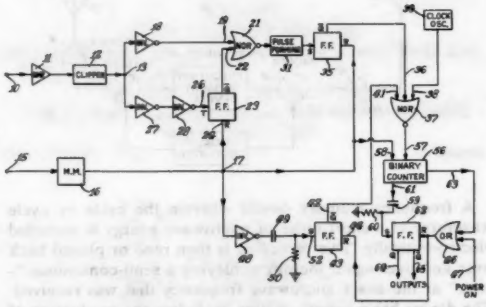
For Patent No. 328—133 see:
Patent No. 3,710,140

3,710,262

SYNCHRONIZED COUNTING SYSTEM FOR COUNTING SYMMETRICAL SIGNALS DURING A TIME BASE

Peter F. Sorensen, Fort Wayne, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Nov. 2, 1971, Ser. No. 194,986
Int. Cl. H03k 21/00, 23/06
U.S. Cl. 328—41 **20 Claims**



This disclosure deals with a system for counting the number of cycles of a symmetrical signal, occurring within a time base. The time base is initiated essentially in synchronism with a point in a cycle of the signal and it is terminated a predetermined time thereafter. A counter counts the cycles occurring during the time base and a count is registered at a second point in each cycle, the second point being displaced one-half cycle from the first point, thus providing an advantageous round-off feature.

3,710,263

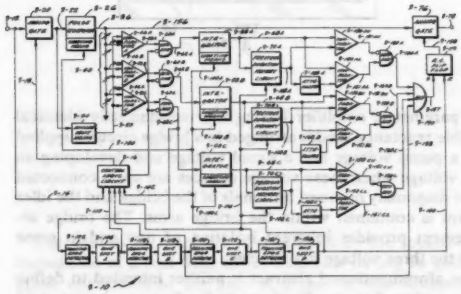
AXIAL TRAJECTORY SENSOR HAVING GATING MEANS CONTROLLED BY PULSE DURATION MEASURING FOR ELECTRONIC PARTICLE STUDY APPARATUS AND METHOD

Edward Neal Doty, and Walter R. Hogg, both of Miami, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed April 9, 1971, Ser. No. 132,771
Int. Cl. H03k 17/02, 5/20
U.S. Cl. 328—91 **46 Claims**

A sensor for use with apparatus operating in accordance with the principles of the Coulter electronic particle studying device for differentiating between particles passing on axial or

nearly axial paths through the aperture of the Coulter device and particles passing off center. The particle pulse duration is measured at two or more fractions of the amplitude of each individual particle pulse. The pulse durations so measured are converted to voltages which are compared with reference voltages derived from similar measurements made on previously processed particle pulses. If the duration of the particle pulse being processed is within specified tolerances of the reference voltages so derived at all of the fractional heights considered, a reconstructed pulse having the amplitude of the accepted pulse is impressed upon the output of the sensor apparatus for use in subsequent pulse height analysis apparatus. All pulses which cannot satisfy the criteria are discarded. Since only those pulses are accepted which have their durations at specified fractional amplitudes which are within a specified tolerance of the reference voltage levels, the acceptance or rejection of a particle pulse is based upon the



shape and duration of said particle pulse, as referred to the criteria derived from pulses occurring in the immediate past history of the train of pulses being furnished to the sensor apparatus. The apparatus of the invention provides structure for deriving a duration-measuring pulse at each fractional amplitude, converting this signal into one which has an amplitude proportional to each fractional height duration, and then subjecting the resulting set of signals to multiple criteria of duration established by voltage levels to operate gating means automatically for rejecting the pulses having improper shapes or durations as determined by these criteria.

A preferred embodiment uses as the said reference level a voltage level which represents a chosen percentile of the duration-measuring pulses, i.e., a voltage level such that, for instance, 25 percent of the duration-measuring pulses are smaller than, and 75 percent of the duration-measuring pulses are larger than the reference level.

3,710,264

AXIAL TRAJECTORY SENSOR HAVING GATING MEANS CONTROLLED BY PULSE DURATION MEASURING FOR ELECTRONIC PARTICLE STUDY APPARATUS AND METHOD

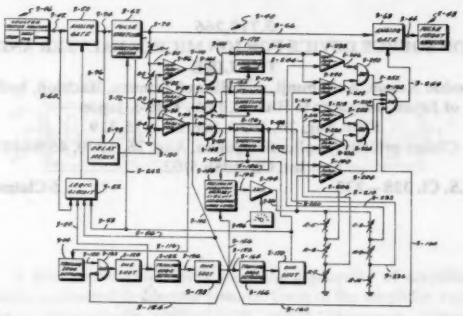
Edward Neal Doty, and Walter R. Hogg, both of Miami, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 132,771, April 9, 1971. This application May 12, 1971, Ser. No. 142,531

Int. Cl. H03k *17/02, 5/20*

U.S. Cl. 328—91 **34 Claims**

A sensor for use with apparatus operating in accordance with the principles of the Coulter electronic particle studying device for differentiating between signals from particles passing on axial or near axial trajectories through an aperture and particles passing off center. The particle pulse duration is measured at two or more fractions of the amplitude for each individual particle pulse. These pulse durations so measured are converted into voltages which represent the respective durations of the several fractional amplitudes and are compared with certain reference voltages. The reference voltage for one fractional amplitude is derived from a memory circuit which remembers the duration at that same fractional amplitude for the smallest of prior pulses processed by the sensor. Using this information, a reference voltage is established for that one fractional amplitude as the maximum permissible level below which the duration-representing voltage is acceptable and above which the duration-representing voltage is not acceptable. This same reference voltage derived from the memory circuit is used to establish maximum and minimum levels for the other fractional amplitude duration-representing voltages. In addition to the one duration-representing voltage falling



below its reference level, the duration-representing voltages of all other fractional amplitudes must fall between the maximum and minimum reference voltages, respectively, which have been established for them in order to operate gating means to pass the particle pulse. All other pulses will be disregarded. On such account, pulses must have the proper shape and duration to be passed by the sensor.

Other structure operating on the relationship between the several durations of the fractional amplitudes of each pulse irrespective of the actual durations pass or discard particle pulses depending upon their shape only, independent of duration.

3,710,265

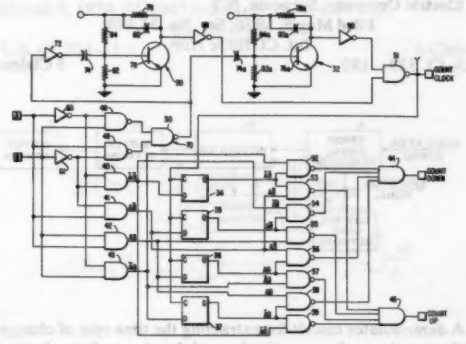
QUADRATURE-TO-SERIAL PULSE CONVERTER

Alden J. Gray, Wallingford, Vt., assignor to Howe Richardson Scale Company, Clifton, N.J.

Filed April 1, 1971, Ser. No. 130,290

Int. Cl. H03k *11/12*

U.S. Cl. 328—61 **12 Claims**



A converter for converting a quadrature pulse train into first and second serial pulse trains which respectively correspond to opposite directions of travel of a generator supplying said quadrature pulse train. The converter comprises a first circuit responsive to said quadrature pulse train for producing a third serial pulse train in which the number of pulses correspond to the total number of pulse edges in said

quadrature pulse train, and a second circuit means responsive to said third pulse train and said quadrature pulse train for forming the pulses of said first and second pulse trains. The second circuit includes a network for supplying the formed pulses to one output terminal when said generator is traveling in one direction to make up said first pulse train and for supplying the formed pulses to another output terminal when the generator is traveling in the opposite direction to make up said second pulse train.

3,710,266

ION SOURCE DEVICE FOR ION MICROANALYZER AND THE LIKE

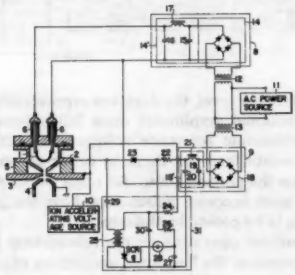
Toshio Kondo, Kokubunji, and Hifumi Tamura, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 26, 1971, Ser. No. 175,219

Claims priority, application Japan, Aug. 26, 1970, 45/84401

Int. Cl. H05h *5/02*

U.S. Cl. 328—233 **5 Claims**



A pulse voltage generating circuit incorporated in an ion source device of the type so as to supply a pulse voltage to an intermediate electrode of the device thereby to allow discharge to occur in said device with high efficiency.

3,710,267

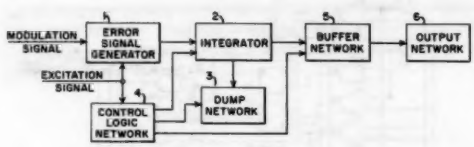
ENVELOPE RATE DEMODULATOR

James W. Fawcett, East Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed May 5, 1970, Ser. No. 34,669

Int. Cl. H03c *1/06*

U.S. Cl. 329—192 **5 Claims**



A demodulator circuit for extracting the time rate of change of the envelope of an amplitude modulated waveform, having particular application to closed loop control systems, for example, where the derived information is employed for a stabilization of an inertial platform. The envelope rate information is extracted directly from the amplitude modulated waveform by performing an integration of the waveform over an integral number of cycles of the carrier frequency, the residual integrated output providing a measure of the envelope's time rate of change.

3,710,268

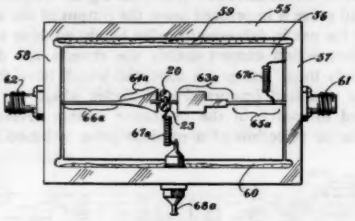
PARAMETRIC AMPLIFIER

Donald Neuf, Wantagh, N.Y., assignor to RHG Electronics Laboratory, Inc., Farmingdale, L.I., N.Y.

Filed Feb. 24, 1970, Ser. No. 13,437

Int. Cl. H03f *7/00*

U.S. Cl. 330—4.9 **6 Claims**



A parametric amplifier having four substantially identical variable reactance diodes arranged in a bridge circuit supplied with a pump voltage and a signal voltage and developing an idler voltage when these voltage sources are each connected to the diagonally opposed terminals of the bridge and the idler current is contained within the bridge arms. The bridge arrangement provides inherent isolation of two and in some cases the three voltage frequencies.

The aforementioned abstract is neither intended to define the invention of the application which, of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,710,269

SEMICONDUCTOR DEVICES

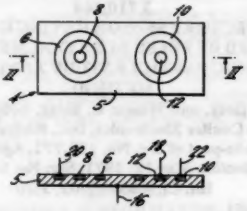
Eliot Patrick Fowler, and Richard William Greaves, both of Dorset, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 16, 1971, Ser. No. 115,654

Claims priority, application United Kingdom, Feb. 13, 1970, 7161

Int. Cl. H03f *3/04*; H01l *11/00*

U.S. Cl. 330—16 **5 Claims**

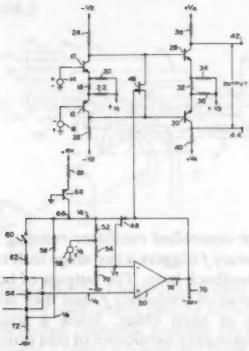


A semi-conductor device embodying the invention is in the form of a lateral transistor and has a substrate of n-type material carrying a base electrode, and diffused-in regions of p-type material one of which carries an emitter electrode and two others of which each carry respective collector electrodes. The collector electrodes are at different distances from the emitter electrode and have substantially different current gains. The device is thus useful as a current amplifier or, in reverse, as a current attenuator.

3,710,270
LINEAR GAIN CONTROL

John L. Addis, and Ronald W. Peltola, both of Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed July 28, 1970, Ser. No. 58,813
Int. Cl. H03g 3/30
U.S. Cl. 330—29 9 Claims

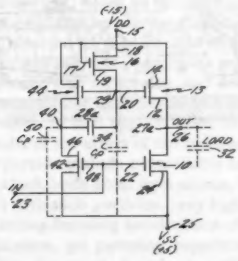


The gain of an amplifier is controlled by the source-drain impedance of a first field effect transistor having its gate terminal connected to the gate of a second and substantially similar field effect transistor. The second field effect transistor has its source-drain circuit connected in a bridge circuit also including a potentiometer with an adjustable tap providing voltage variations for unbalancing the bridge output. The bridge output operates a differential operational amplifier connected to drive the second field effect transistor for restoring bridge balance. The source-drain impedance of the second field effect transistor, and hence the source-drain impedance of the first field effect transistor, are thereby controlled in proportion to the setting of the aforementioned potentiometer, for adjusting amplifier gain.

3,710,271
FET DRIVER FOR CAPACITIVE LOADS

James A. Putnam, Levittown, Pa., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 12, 1971, Ser. No. 188,041
Int. Cl. H03f 3/16
U.S. Cl. 330—35 1 Claim

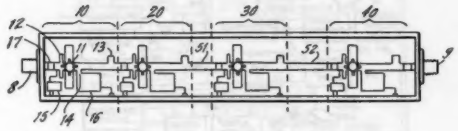


A field effect transistor (FET) amplifier circuit for driving capacitive loads includes two amplifier stages, each having an input FET and a related load FET, one stage driving the load, the other stage providing capacitively coupled bootstrap drive to the load FET of the load driving stage.

3,710,272
MULTI-STAGE TYPE MICROWAVE AMPLIFIER

Kazuo Ayaki, Tokyo-to, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 790,989, Jan. 14, 1969, Pat. No. 3,631,358. This application Oct. 4, 1971, Ser. No. 186,146
Claims priority, application Japan, Jan. 17, 1968, 43/2513; Jan. 17, 1968, 43/2514; May 7, 1968, 43/31415; May 7, 1968, 43/31416; May 7, 1968, 43/31417
Int. Cl. H03k 3/60
U.S. Cl. 330—53 5 Claims

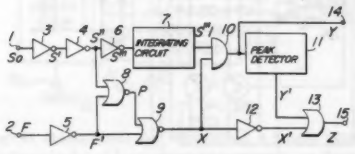


A microwave amplifier comprising a plurality of amplifier units connected in cascade fashion. Each of the amplifier units have substantially similar gain versus frequency characteristics, which characteristics are substantially flat over the entire operating frequency range. The units are connected by lines which in the microwave amplifier embodiment may be strip lines having electrical lengths which are selected in accordance with any one of a group of predetermined equations so as to provide a multi-stage microwave amplifier whose resultant gain versus-frequency characteristic is likewise substantially flat over the entire operating frequency range.

3,710,273
AUTOMATIC FREQUENCY CONTROL

Keisuke Yamamoto, Hirakata, and Toshimitsu Fujimori, Ibaragi, both of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Feb. 4, 1971, Ser. No. 112,564
Claims priority, application Japan, Feb. 13, 1970, 45/12710; Feb. 13, 1970, 45/12711; Feb. 13, 1970, 45/12712; March 9, 1970, 45/20674; Sept. 3, 1970, 45/77425
Int. Cl. H03b 3/04
U.S. Cl. 331—1 A 6 Claims

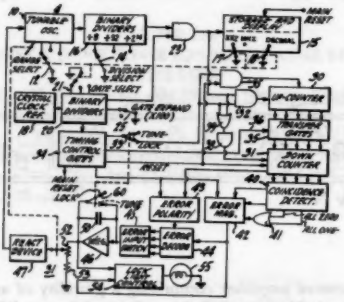


An automatic frequency control (AFC) in which the sync signal and flyback signal are compared to detect the direction and amount of deviation of the flyback signal with respect to the sync signal, thereby producing AFC voltage pulses to control the oscillator of the horizontal circuit in the television set. The polarity of the pulses is determined by the direction or sense of deviation, and the pulse width is determined by the amount of deviation.

3,710,274
FREQUENCY CONTROL OF OSCILLATORS USING DIGITAL TECHNIQUES

Philip Basse, Freeport, and Frank J. Sposato, Huntington, both of N.Y., assignors to Logimetrics, Incorporated, Greenvale, N.Y.

Filed April 12, 1971, Ser. No. 133,111
Int. Cl. H03b 3/04
U.S. Cl. 331—1 A 14 Claims

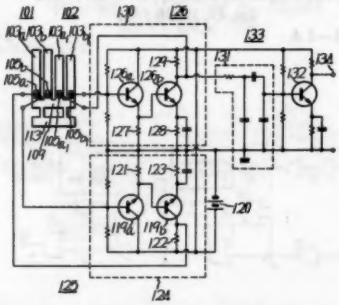


Frequency control apparatus for an oscillator includes a first up-counter and a down-counter. A number representative of an oscillator's frequency is stored in the first counter during a given interval and then transferred to said down-counter. The down-counter is then caused to count down said frequency during the same interval. At the termination of this interval, the down-counter has stored therein a count manifesting the variation of the oscillator's frequency, which count is detected and processed to provide a control signal used to vary the oscillator's frequency in a direction to tend to cause the down-counter to indicate all zeroes at the end of said interval.

3,710,275
LOW FREQUENCY OSCILLATOR EMPLOYING A PAIR OF U-SHAPED MECHANICAL VIBRATORS

Tetsuro Tanaka, Kyoto, and Kiyoshi Bansho, Tokyo, both of Japan, assignors to Shigeru Kakubari, Tokyo, Japan

Division of Ser. No. 754,416, Aug. 21, 1968, abandoned, Continuation of Ser. No. 88,507, Nov. 10, 1970, Pat. No. 3,659,230. This application Nov. 5, 1970, Ser. No. 87,305
Int. Cl. H03b 5/30
U.S. Cl. 331—37 3 Claims

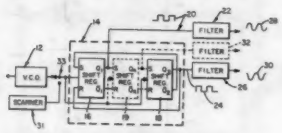


A U-shaped mechanical vibrator having a pair of strip-like vibratory reeds of substantially the same configuration, and a base portion coupling together the pair of vibratory reeds at one end as a unitary structure, the width of each reed being selected greater than the thickness thereof, the vibratory reeds being arranged in a single plane including their surfaces in the widthwise direction in parallel and side-by-side relation, and the pair of vibratory reeds vibrating in anti-phase relation to each other at right angles to the single plane.

3,710,276
DIGITAL VARIABLE QUADRATURE SINE WAVE VOLTAGE CONTROLLED OSCILLATOR

Tich T. Dao, Cupertino, Calif., assignor to Ampex Corp., Redwood City, Calif.

Filed June 1, 1971, Ser. No. 148,345
Int. Cl. H03b 19/14, 27/00
U.S. Cl. 331—45 5 Claims

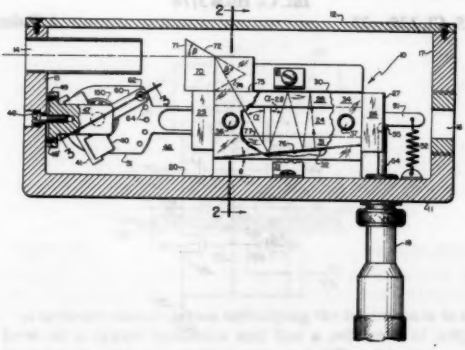


A pulse voltage controlled oscillator running at four times the desired frequency *f* triggers a two stage shift register which has an inverted feedback loop. The outputs of both stages are similar square waves of frequency *f*, and they are set at a 90° phase difference of each other. Since a square wave of frequency *f* possesses only harmonics of odd orders, a low pass filter which rejects 3*f* can admit a square wave frequency varying between *f* and 3*f*. A pair of identical filters coupled to the outputs of respective shift register stages provide output signals of corresponding frequency which are 90° out of phase. For a frequency range extending between 3*f* and 9*f*, another pair of filters are required, etc. Additional shift registers may be added to the two stage shift register to provide output signals with a phase shift equal to the corresponding fraction of 360°.

3,710,277
LIGHT PUMPED LASER

Dewey C. Forbes, Jr., Belmont, Mass., assignor to Xenon Corporation, Medford, Mass.

Filed Feb. 17, 1970, Ser. No. 12,099
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 5 Claims



A light-pumped dye Laser having input and output paths parallel and the input radiation deflected into the cavity at an angle less than 90°, the sides of the cavity being reflective and inclined so that the input radiation travels by repeated reflections along the cavity without reaching the end.

3,710,278

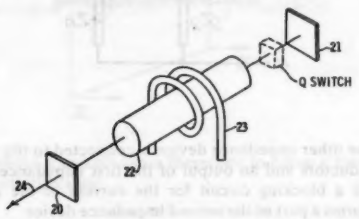
CALCIUM-YTTRIUM SILICATE OXYAPATITE LASERS

Richard H. Hopkins; George W. Roland, both of Monroeville; William D. Partlow, Blackridge, and Kenneth B. Steinbruegge, Murrysville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 859,672, Sept. 22, 1969. This application June 21, 1971, Ser. No. 154,982

Int. Cl. H01s 3/16

U.S. Cl. 331—94.5 10 Claims



A composition of matter which can be used as a laser crystal in a laser generator and which can be doped with sensitizer ions has the empirical chemical formula $CaY_{4-x}(SiO_4)_3O:A_x$, where A represents a lasing ion selected from Nd and Er and x has a value from 0.001 to 1.

3,710,279

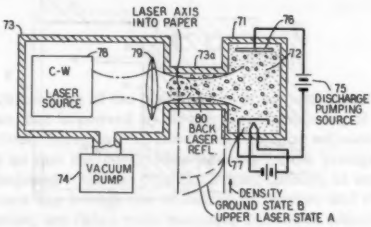
APPARATUSES FOR TRAPPING AND ACCELERATING NEUTRAL PARTICLES

Arthur Ashkin, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 15, 1969, Ser. No. 885,070

Int. Cl. H01s 3/06, 3/09

U.S. Cl. 331—94.5 6 Claims



There is disclosed a variety of apparatuses for controlling by radiation pressure the motion of a particle free to move with respect to its environment, based on the discovery that one or more beams of optical radiation can have frequency, diverging shape or intensity selected for a controlled radiation-pressure interaction with the particle that overpowers gravity and collision effects of atoms and molecules and overpowers any photophoresis interaction of the particle and its environment due to a heating effect of said particle upon its environment. The disclosed results of the effect of the radiation pressure on the motion of the particle include controllably heating the particle to provide a black-body point light source, bombardment of a sample target with such particles, very high energy particle acceleration, strong-focusing acceleration of a neutral particle, isotope separation, gas pumping, separation of particles by size, population inversion based on radiation-pressure separation of excited species, vacuum deposition of thin films from ultrapure particles controllably vaporized while held by radiation pressure, tensile-strength testing of materials based on the radiation-pressure effect of circularly polarized light, contaminant-free trapping or bottling of neutral gases, molecular beam separation and deflection, acceleration measurement for inertial guidance and measurement of very low gas pressures.

3,710,280

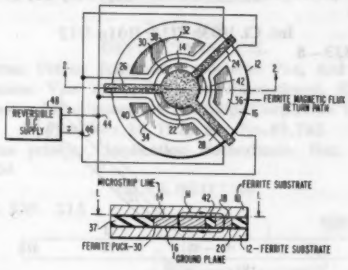
DEPOSITED LATCHED JUNCTION CIRCULATOR HAVING MAGNETIC FLUX RETURN PATHS

Daniel C. Buck, Hanover, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 12, 1971, Ser. No. 188,077

Int. Cl. H01p 1/32, 5/12

U.S. Cl. 333—1.1 12 Claims



A latching ferrite circulator utilizing deposited ferrite layers and operable without the requirement of a permanent magnet. A pair of separated ferrite layers respectively include a microstrip transmission line circuit and a ground plane on faces which oppose each other. The microstrip transmission line comprises at least one hub circuit portion and a plurality of circuit arm portions. At least two coplanar ferrite elements are deposited between the microstrip transmission line circuit and the ground plane. One ferrite element comprises the circulator element and is placed contiguous with the hub while the other ferrite element comprises a magnetic return path member which is located a predetermined distance from the circulator element. A latching conductor is located generally in the plane of the microstrip circuit intermediate the two ferrite elements so that when a DC current pulse is applied to the latching conductor, a closed magnetic circuit loop is provided through the two ferrite elements and the ferrite layers containing the microstrip circuit and the ground plane.

3,710,281

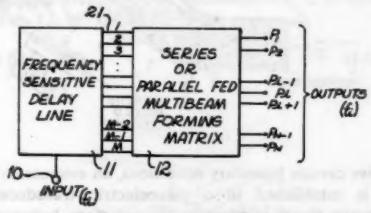
LOSSLESS N-PORT FREQUENCY MULTIPLEXER

Delmer L. Thomas, North Hollywood, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 10, 1970, Ser. No. 96,911

Int. Cl. H01p 5/12

U.S. Cl. 333—6 7 Claims



An N-port multiplexer for separating a single input signal into N distinct isolated frequency components on discrete output terminals. The device is adapted to accomplish this function in a reciprocal, passive, lossless manner, in respect to an arbitrarily large number of such components. The multiplexer basically comprises two known microwave circuit devices uniquely combined. One of these is a frequency sensitive delay line with a plurality of taps and the other is a beam-forming matrix, such as a Butler matrix, or the so-called equal-path-length cross-line matrix. In a receiving mode, the delay line input is the signal to be separated and the taps are fed to the radiating element terminals of the beam-forming matrix. The matrix output terminals then provide the discrete frequency output lines.

3,710,282

ARRANGEMENT FOR THE DECREASE OF REFLECTION INTERFERENCES WITHIN NETWORKS FOR PULSE TRANSMISSIONS

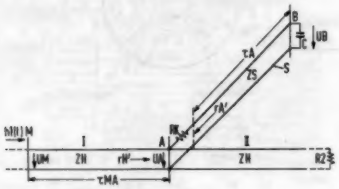
Siegfried Seinecke, Soecking, Germany, assignor to Siemens Aktiengesellschaft

Filed April 29, 1971, Ser. No. 138,583

Claims priority, application Germany, May 13, 1970, P 20 23 503.4

Int. Cl. H03h 7/38; H01p 5/12

U.S. Cl. 333—8 1 Claim



An arrangement for reducing reflection interference within a pulse transmission network which has a main transmission line and a plurality of branch transmission lines which are predominantly capacitively loaded wherein adjacent the connection of a branch transmission line to the main transmission line there is provided a resistor in series with the branch transmission line and having a resistance value equal to the wave resistance of the branch line minus half the wave resistance of the main transmission line.

3,710,283

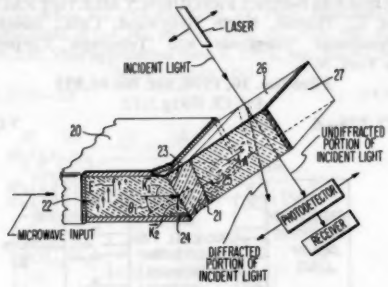
APPARATUS FOR EFFICIENTLY CONVERTING MICROWAVE ENERGY INTO ACOUSTIC ENERGY

Gerard Argant Alphonse, Princeton, N.J., assignor to RCA Corporation

Filed Nov. 18, 1971, Ser. No. 199,886

Int. Cl. H03h 9/00

U.S. Cl. 333—30 R 7 Claims



Under certain boundary conditions, an evanescent electric field is established in a piezoelectric transducer by a microwave signal incident at the interface between a first dielectric medium and the piezoelectric transducer. The result is an efficient conversion from microwave energy to acoustic energy by the piezoelectric transducer.

3,710,284

HARMONIC FILTER

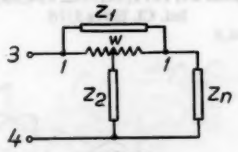
Erich Uhlmann, Ludvika, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed March 1, 1971, Ser. No. 119,730

Int. Cl. H03h 7/04

U.S. Cl. 333—75 5 Claims

A harmonic filter is connected between two conductors joining a harmonic source to a network. The filter is composed of two impedance devices each including at least one impedance element, the impedance elements being either beoth inductive or both capacitative. One of the impedance devices is connected as a series element in one of the conductors,



while the other impedance device is connected to the other of the conductors and an output of the first impedance device. There is a blocking circuit for the current of the network which forms a part of the second impedance device.

3,710,285

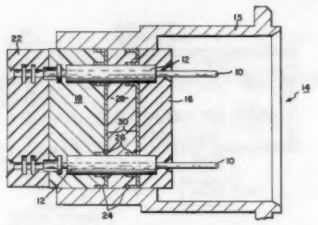
FILTER PIN CONNECTOR HAVING LOW GROUND RETURN IMPEDANCE

Ferdinand William Schor, Altadena, Calif., and William Baird Fritz, Hershey, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 25, 1971, Ser. No. 109,423

Int. Cl. H03h 7/14, 7/04

U.S. Cl. 333—79 7 Claims



A plurality of ground planes establish a low impedance ground return circuit for a filter pin connector comprising a connector pin, a tubular filter, and a housing. The ground planes comprising thin metal sheets in electrical contact with the outer surface of the tubular filter are sandwiched between various insulators of the housing.

3,710,286

CONTROL OF MICROWAVE POWER BY APPLYING STRESS TO GADOLINIUM MOLYDATE SINGLE CRYSTAL

Kelichiro Aizu, Tokyo; Akio Kumada, Kodaira, and Masashi Koga, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

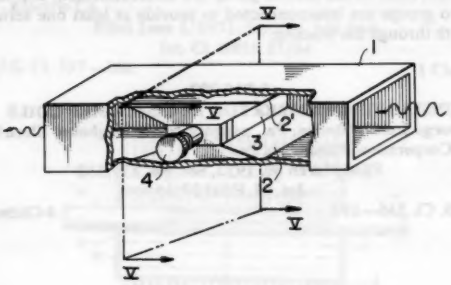
Continuation-in-part of Ser. No. 862,619, Sept. 9, 1969, abandoned. This application July 28, 1971, Ser. No. 166,664

Int. Cl. H01p 1/22

U.S. Cl. 333—81 B 2 Claims

Ferroelastic materials vary in their even-rank polar tensorial properties or similar anisotropic properties when they are

shifted from one orientation state to another. A body of such ferroelastic material is combined with means for applying



stress above a certain value thereonto to cause a transition of the orientation state.

3,710,287

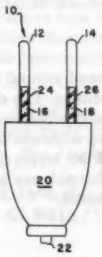
INSULATED PLUG

William F. Eckert, 729 Milyer Lane, Baltimore, Md.

Filed July 1, 1971, Ser. No. 158,678

Int. Cl. H01r *19/04*

U.S. Cl. 339—195 R **1 Claim**



An electrical plug of the type used with convenience outlet receptacles, but improved by having insulation integral with and effectively faired-in with the prong structure adjacent the plug body so that the conductive portions of the prongs can never be exposed while the plug is carrying current; in various embodiments the prongs are undercut to receive and retain the insulation, are fitted with insulative sleeves of effectively zero obstruction thickness, and have divided portions to receive and retain molded-in-place insulation.

3,710,288

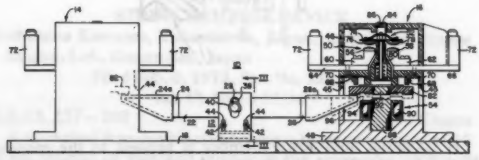
MECHANICAL INTERLOCK FOR ELECTRICAL CONTACTORS

Kurt A. Grunert, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 8, 1971, Ser. No. 196,430

Int. Cl. H01h *9/24*

U.S. Cl. 335—160 **4 Claims**



Mechanical interlock assembly for two or more electrical contactors in which the contactors each comprise a movable contact structure associated with electromagnetic means for actuating the movable contact structure for closing a circuit through the contactor; and a lever pivotally mounted between the contactors and having opposite end portions disposed in the path of movement of corresponding movable contact structures for holding one structure in a "closed-circuit" position and the other structure in an "open-circuit" position.

3,710,289

DEFLECTION COIL

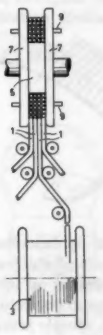
Wilhelmus Petrus Johannes Franciscus Pax, and Henricus Johannes Van Rooy, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Nov. 16, 1970, Ser. No. 89,785

Claims priority, application Netherlands, Dec. 4, 1969, 6918204

Int. Cl. H01f *5/00*

U.S. Cl. 335—213 **3 Claims**



Deflection coil, obtained by bending into a part-cylindrical shape a coil comprising a plurality of glue-coated insulated wires simultaneously wound side by side without insulating intermediate layers, each wire forming a flat spiral.

3,710,290

POLARIZED ELECTROMAGNETIC RELAY

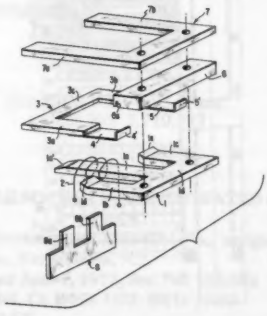
Egbert Kuipers, Heiligenhaus; Paul Gunnewig, Essen, and Horst Menz, Lintorf, all of Germany, assignors to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 3, 1971, Ser. No. 195,435

Claims priority, application Germany, Nov. 3, 1970, P 20 54 051.6; Feb. 12, 1971, P 21 06 764.1

Int. Cl. H01f *7/08*

U.S. Cl. 335—230 **14 Claims**



A polarized electromagnetic relay of the conductor plate type in which a single permanent magnet is disposed between

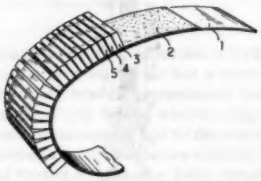
body portions of an E-shaped core yoke and a U-shaped yoke. A U-shaped armature is resiliently supported coaxially of its legs from the body portion of the E-shaped core yoke for swinging movement between the yokes. The center leg of the E-shaped core yoke is longer than the outer legs and in response to a reversal of direction of flux in the armature, the armature moves between first and second stable positions in which it bears against the legs of the U-shaped yoke and the free end of the center, and the free ends of the outer legs, respectively, of the E-shaped core yoke.

3,710,291

PERMANENT MAGNET

Gilbert Nicoud, Allevard, France, assignor to Societe d'Etudes et de Recherches Magnetiques "Sermag"

Filed Nov. 17, 1971, Ser. No. 199,647
Claims priority, application France, Nov. 18, 1970, 7041301
Int. Cl. H01l 7/02
U.S. Cl. 335—306 **8 Claims**



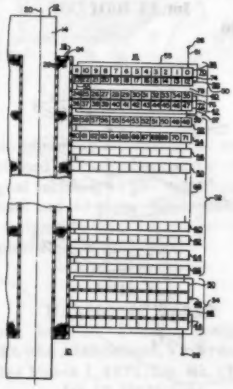
A permanent magnet is described, which is particularly adapted for use in stators of electric motors or in attraction devices which should present an involved attracting surface, together with high magnetic performance. A plurality of small ferrites pieces are stuck, closely juxtaposed on a flexible sheet of magnetic or non magnetic material. Preferably, the supporting sheet is non magnetic, and the ferrite pieces have a magnetization pattern which alternates the polarities according to a predetermined pitch.

3,710,292

ELECTRICAL WINDINGS

Robert I. Van Nice, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 8, 1971, Ser. No. 151,116
Int. Cl. H01f 27/08, 15/14
U.S. Cl. 336—60 **11 Claims**



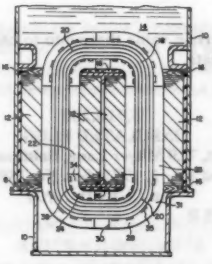
A winding for electrical inductive apparatus having first and second groups of axially aligned pancake coils of the continuous type. The coils of the first group are spaced and interconnected to increase the series capacitance of the group, adjacent coils of the second group are interconnected, and the two groups are interconnected to provide at least one series path through the winding.

3,710,293

INSULATING MEMBER FOR TRANSFORMER COILS

George Lazor, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 30, 1972, Ser. No. 239,532
Int. Cl. H01f 27/30
U.S. Cl. 336—198 **4 Claims**



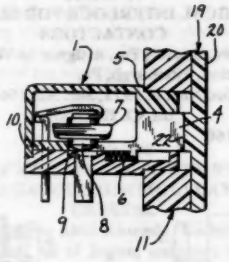
U-shaped channels extend around the edges of the coils of shell-form power transformers. The channels are constructed of layers of crepe paper and pressboard with at least one layer of crepe paper separating adjacent layers of pressboard. An adhesive is used to bond the layers together. In one embodiment, the edges of the channels are scarfed to form a scarfed joint with an adjacent channel.

3,710,294

CONVERTIBLE THERMAL SAFETY CUT-OUT SWITCH

James P. Dries, Milwaukee, Wis., assignor to Doerr Electric Corporation, Cedarburg, Wis.

Filed March 9, 1972, Ser. No. 233,072
Int. Cl. H01h 71/16
U.S. Cl. 337—66 **7 Claims**

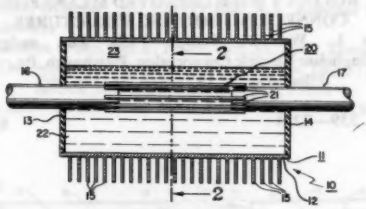


A frangible hold-down member is applied to the manual button for resetting a cut-out switch, thereby conditioning the switch for automatic reset when the member is in place and for only manual reset when the member is removed.

3,710,295
CURRENT LIMITING FUSE

Fred W. Staub; James C. Corman, both of Scotia, and Gunnar E. Walmet, Schenectady, all of N.Y., assignors to General Electric Co.

Filed June 1, 1971, Ser. No. 148,844
Int. Cl. H01h *85/04*
U.S. Cl. 337—166 **1 Claim**

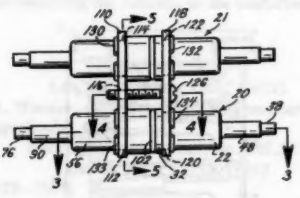


Low thermal mass fusible conducting elements are in nucleate boiling relationship to a dielectric liquid for normal large operating currents with resultant high heat transfer coefficient. For currents of short duration and substantially larger in magnitude than normal currents, the fusible conductive elements are in vapor film boiling relationship to the dielectric liquid with resultant heat transfer coefficient which is several orders of magnitude lower than the heat transfer coefficient for nucleate boiling. Accordingly, for currents of very large amplitude and short durations heat buildup and temperature rise of the fusible elements to the melting point thereof is rapid with resultant rapid circuit interruption.

3,710,296
PROTECTOR FOR ELECTRIC CIRCUITS

Angelo Urani, St. Louis, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Nov. 4, 1970, Ser. No. 86,861
Int. Cl. H01h *85/50*
U.S. Cl. 337—213 **8 Claims**



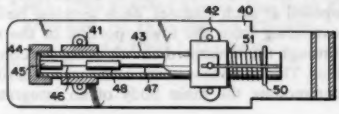
A support for a plurality of "in-the-line" fuse holders selectively holds those fuse holders in fully assembled condition or initiates separation of the body portions of those fuse holders to permit the electric fuses held by those fuse holders to be inspected or replaced.

3,710,297
STRETCHED FUSE DEVICE

Toshinobu Kawazoe, Tokorozawa, Japan, assignor to Nippon Denzai, Ltd., Gunma-ken, Japan

Filed Feb. 4, 1972, Ser. No. 223,626
Int. Cl. H01h *85/36*
U.S. Cl. 337—290 **2 Claims**

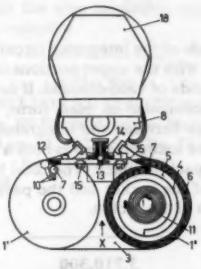
A stretched fuse device comprising a brass wire made of 45 to 48 percent of zinc and copper as the remainder with a β phase accounting for more than 90 percent of said alloy, said fuse being stretched in introducing electric current therethrough, wherein the cutoff of said fuse enables, if necessary, either or both of the closure of an alarm circuit and the indication of said cutoff to be effected.



3,710,298
DRIVE MECHANISM FOR ELECTRICAL CIRCUIT BREAKERS

Harald Strubin, Neuenhof, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Nov. 22, 1971, Ser. No. 200,767
Claims priority, application Switzerland, Dec. 9, 1970, 18309/70
Int. Cl. H01h *37/76*
U.S. Cl. 337—401 **10 Claims**



A drive for the contact mechanism of an electrical circuit breaker includes a double-acting pneumatic motor coupled to the contact mechanism for effecting disengagement as well as engagement of the contacts which is driven by explosion gases generated by the firing of cartridges stored in magazines, the cartridges being fed automatically from the magazines into firing chambers provided in a rotationally mounted drum. Cartridge feed into and ejection from the firing chambers from the magazines is accomplished in alternation as the drum is rotated alternately in opposite directions, and each firing chamber is associated with a duct leading to a corresponding end of the motor cylinder so that when a cartridge is fired in one chamber, the motor piston is driven in one direction, and as the next cartridge is fired in the other chamber, the motor piston is driven in the other direction. The necessary alternate rotation of the drum in opposite directions is obtained from the explosion gases themselves.

ERRATUM

For Class 339—195 R see:
Patent No. 3,710,287

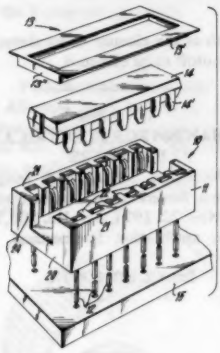
3,710,299
LOW PROFILE SOCKET FOR INTEGRATED CIRCUIT PACK

Lawrence P. Weisenburger, Ottsville, Pa., assignor to Aries Electronic, Inc., Frenchtown, N.J.

Filed June 1, 1971, Ser. No. 148,663
Int. Cl. H05k *1/02*; **H01r** *13/02*
U.S. Cl. 339—17 CF **8 Claims**

A low profile socket for accommodating an integrated circuit pack to be mounted on an integrated circuit board is

characterized by having a U-shaped cross section, with the inside portion of each upstanding wall being defined by a plurality of 3-sided channels defined by partitions extending transverse to the longitudinal axis of the socket. A terminal pin is disposed at each channel, each terminal having a post section extending from the lower portion of the socket for passage through the integrated circuit board for connection to a conductor. The transverse width of the socket is sufficient to fully accommodate the main body of an integrated circuit



pack, with the leads of the integrated circuit pack establishing electrical contact with the upper portions of the terminal pins through the open side of each channel. If desired, a molded insert generally rectangular in plan form, is adapted to be snapped into place between the integrated circuit pack and the partitions of the socket for use as both a cover and a means for retaining the pack in place. The total height of the composite assembly of the socket and the pack is approximately equal to the height of the socket.

3,710,300

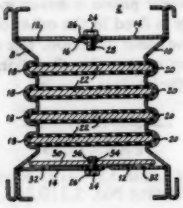
CLAMPING ADJUSTMENT FEATURE FOR BUS DUCT HOUSING

Martin F. Koenig, Milwaukee, Wis.; Frank A. De Backer, Wichita, Kans.; Manuel Issa, deceased, late of Milwaukee, Wis., and Patrick T. Sheedy, administrator, Fox Point, Wis., assignors to Cutter-Hammer, Inc., Milwaukee, Wis.

Filed March 5, 1971, Ser. No. 121,489

Int. Cl. H01r *13/60*

U.S. Cl. 339—22 B **1 Claim**



A two-part housing for a plug-in bus duct having longitudinally extending corrugations in the opposite sidewalls cooperatively supporting a plurality of spaced insulated bus bars along their opposite edges. Upper and lower walls of each housing part meet in overlapped relationship and are secured together by longitudinally spaced screws which extend through slotted or exaggerated clearance holes in one wall to thread into alined extruded holes in the other wall, the clearance holes providing inward adjustment of the housing parts during tightening of the screws to provide intimate contact between bus bars and sides for maximum heat dissipation regardless of tolerance conditions. An alternative construction includes a ground bus bar adjacent the overlapped lower walls with clearance holes in each wall and the screws threading into alined holes in the ground bar to position the bar and provide for added electrical continuity from bar to housing as well as secure the housing.

3,710,301

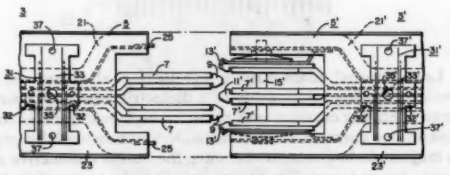
BUS DUCT WITH IMPROVED MEANS FOR CONNECTING HOUSING STRUCTURES

Charles L. Weimer, Beaver Falls, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 24, 1971, Ser. No. 146,202

Int. Cl. H01r *13/60*

U.S. Cl. 339—22 B **6 Claims**



Bus duct comprises two connected sections with each section comprising a housing and a plurality of bus bars supported in the housing. An improved joint cover covers an opening in the housings at the connection and provides structural strength for the housings at the connection.

3,710,302

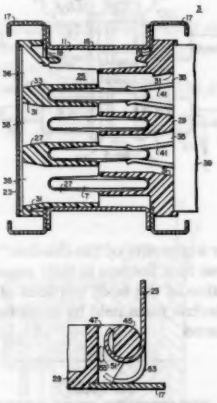
BUS DUCT WITH HINGED COVER FOR PLUG-IN REGION

Bill M. Shannon, Rochester, and Charles L. Weimer, Beaver Falls, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 24, 1971, Ser. No. 146,205

Int. Cl. H01r *13/60*

U.S. Cl. 339—22 B **8 Claims**



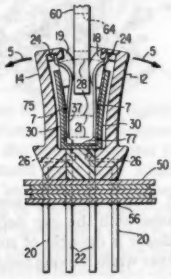
A section of plug-in type bus duct comprises a plug-in region at an opening in the housing of the duct. A plug-in insulating member, having opening means therein, is supported in the housing at the plug-in region. A plug-in cover is pivotally mounted on the insulating member to cover the opening means in the insulating member. The cover is formed with a resilient latch at the pivoted end thereof that cooperates with

the housing to maintain the cover in the open position and another resilient latch at the opposite end thereof that cooperates with the insulating member to maintain the cover in the closed position. The parts are constructed such that the plug-in cover is captured on the insulating member when the insulating member is mounted in the housing.

3,710,303
EDGE CONNECTOR

Jacob Boon Gallager, Jr., Cherry Hill, N.J., assignor to RCA Corporation

Continuation of Ser. No. 872,943, Oct. 31, 1969, abandoned. This application Sept. 13, 1971, Ser. No. 180,072
Int. Cl. H05k *1/07*; **H01r** *13/54, 13/62*
U.S. Cl. 339—61 M **19 Claims**

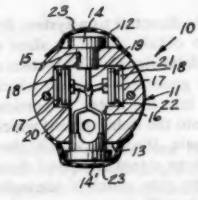


An edge connector for a printed circuit board includes a housing detachably secured to a plurality of contact elements. A conductor is provided within the housing to form a transmission line with the contact elements. The transmission line thus formed has a characteristic impedance equal to that of the circuitry associated with the respective contact elements. Cam surface projections are included which shift the contact elements beyond the insertion path of the circuit board in response to the insertion of the board into the connector. The conductor which provides the characteristic impedance cooperates with the shifting projection to secure the housing to the contact elements and to provide a spring load on the housing for returning the housing to the unshifted state.

3,710,304
LOCKING ELECTRIC PLUG

Joseph W. Warner, and Richard J. Warner, both of P.O. Box 222, Terrebonne, Oreg.

Filed May 5, 1971, Ser. No. 140,321
Int. Cl. H01r *13/54, 13/62*
U.S. Cl. 339—74 R **2 Claims**

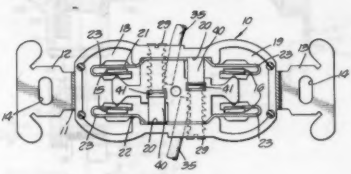


An electric plug of the female type, including a rod and toggle arrangement having pushbuttons so as to frictionally engage the tongs of a male plug received within the plug to prevent the male plug from slipping out of the female plug.

3,710,305
SOLDERLESS ELECTRICAL OUTLET ASSEMBLY FOR SERVICE CORD

Marvin A. Clark, 7902 Woodley Avenue, Van Nuys, Calif.

Filed Aug. 10, 1971, Ser. No. 170,495
Int. Cl. H01r *11/20, 9/06*
U.S. Cl. 339—97 R **20 Claims**

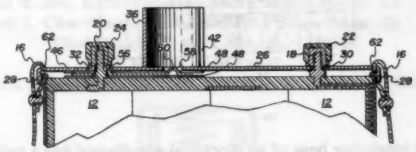


A solderless electrical outlet assembly utilizing a threaded shank effective to complete assembly of the components as well as to provide mechanical and electrical connections between an insulated conductor and a female contact strip. The screw employed for this purpose seats in a threaded well molded into the main body of the outlet assembly. The screw threads cut through the wire insulation prior to penetrating the surface of the conductor.

3,710,306
SUPPORT FOR AN ELECTRIC CELL

Lauris J. McCarthy, 99 North Hermosa, Sierra Madre, Calif.

Filed Aug. 13, 1971, Ser. No. 171,522
Int. Cl. H01r *19/46*
U.S. Cl. 339—108 R **5 Claims**



The support includes a plate having two openings, each receiving one of the two terminals of an electric cell. The cell is attached to the plate by attaching the terminals to the plate. The plate carries a socket for a multiple contact plug.

A conductor connects one of the terminals with a contact that leads to the socket. Carrying means in the form of a strap is attached to the plate.

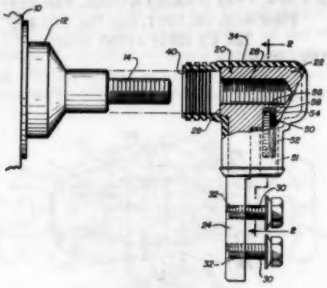
3,710,307
ELECTRICAL CONNECTOR

James Joseph Cooper, Jr., St. Louis, Mo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 20, 1970, Ser. No. 65,372
Int. Cl. H01r *13/54, 13/30*
U.S. Cl. 339—116 C **3 Claims**

A connector for making an electrical connection to a threaded stud for power distribution applications such as transformer applications. A conductive connector threaded at one end to receive the stud is insulated with a protective jacket which mates with the stud bushing to enclose the connection. A set screw projects through the insulation into a threaded socket to bear against the stud when the set screw is tightened. The bearing surface may be a section of the wall of the body within the threaded area or may be an inset pressure

pad, or plastic set screw tip. The free end of the connector may have a suitable connector for connection to a cable. A



slideable insulating sleeve or boot fitted over the last mentioned connector may insulatingly cover the entire connection.

3,710,308

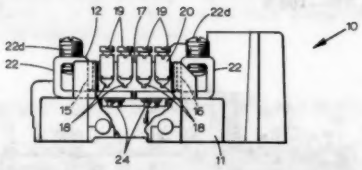
INSULATING BASE AND NEUTRAL WIRE CONNECTOR ASSEMBLY FOR CIRCUIT BREAKER PANELBOARD

John E. Horwell, Lexington, Ky., assignor to Square D Company, Park Ridge, Ill.

Filed June 9, 1971, Ser. No. 151,215

Int. Cl. H01r 9/00

U.S. Cl. 339—198 N **3 Claims**



An insulating base of an electrical panelboard has a pair of spaced parallel wall portions straddling a branch neutral wire connector bar. A pair of main neutral wire connectors have connector body portions disposed respectively on the outer sides of the wall portions and mounting strap portions extending respectively through the wall portions and secured respectively to opposite end portions of the branch neutral wire connector bar.

3,710,309

MAGNETIC TRANSDUCER COMPONENTS

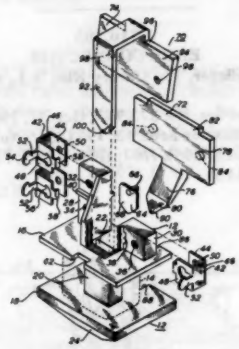
Stephen Bartok, Clifton, N.J., assignor to Litton Business Systems, Inc., New York, N.Y.

Filed Sept. 4, 1969, Ser. No. 855,123

Int. Cl. H01r 9/16

U.S. Cl. 339—217 S **3 Claims**

A handheld magnetic transducer comprises a gun-shaped housing having a directional arrow on one surface. The arrow is illuminated by a light within the housing indicating the operating state of the transducer as determined by a signal device. The housing has dimples in opposed side walls for ease of grasping. The armature is in two parts. Each part has a T-shaped portion the crossbars of which overlap. The armature is inserted within the bobbin and is resiliently held at the crossbars to lock into position with a shim. The bobbin front wall in combination with the armature and shim form the muzzle or reading end of the transducer and has a substantially frustro pyramidal shape. The armature-bobbin structure is held in place by fingers which form a part of the transducer housing. The wires from the coil are secured to clips. The clips or terminal are U-shaped members spring retained on arms of the bobbin. The clips each have a flange portion for engaging an



aperture in the arm. The reading portion of the transducer is hemispherical in shape with the gap defining an arc thereon such that the transducer is capable of rotation or positioning about one of three axes while moving relative to a record.

3,710,310

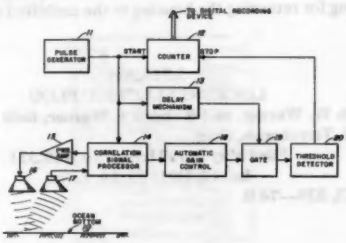
SYSTEM FOR DETERMINING DEPTH OF WATER

George J. Moss, Jr., Bethesda, Md., and George M. Walsh, Middletown, R.I., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 23, 1970, Ser. No. 100,932

Int. Cl. G01s 9/68

U.S. Cl. 340—3 R **3 Claims**



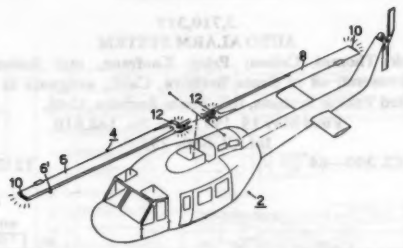
This disclosure is directed to a system for surveying ocean or inland water to obtain depth or slant range information without recording false signals. The system makes use of a single generator that generates a signal which starts a counter and is transmitted into the water. A portion of the generated signal is directed into the delay circuit which delays the signal that controls a gate through which the return signal is processed. The return signal is passed through an automatic gain control and the gate which is controlled by the delayed signal. The delay is sufficient to prevent processing of any false signals. The return signal that passes through the gate is detected and stops the counter which was started upon initiation of the generated signal. The counter output is directed to a digital recorder which indicates a measure of distance in accordance with the amount of time the counter was operational.

3,710,311

HELICOPTER LIGHTING SYSTEM AND LIGHT UNITS USEFUL THEREIN

Ron Avital, 134 Katzenelson Street, Givatavim, Israel

Filed Nov. 23, 1970, Ser. No. 92,055
Claims priority, application Israel, Nov. 28, 1969, 33446
Int. Cl. G08g 5/00
U.S. Cl. 340—27 8 Claims



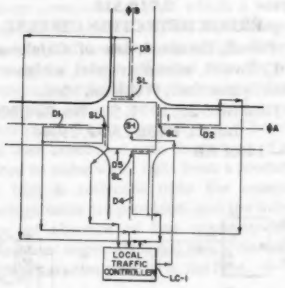
The invention relates to helicopter lighting systems particularly for night formation flying. The system includes a first light unit attached to the main helicopter rotor in the vicinity of its tip and a second light unit attached to the main helicopter rotor at a location thereon spaced inwardly from the tip. Upon rotation of the helicopter rotor, the light units provide a light pattern providing a quickly discernible indication to an observer of the attitude of the helicopter and of any change in heading thereof relative to the observer.

3,710,312

METHOD AND APPARATUS FOR CONTROLLING TRAFFIC FLOW IN ACCORDANCE WITH TRAFFIC PRESENCE

Frank W. Hill, Moline, Ill., assignor to Gulf & Western Industries, Inc., New York, N.Y.

Division of Ser. No. 870,449, Oct. 23, 1969, Pat. No. 3,602,882, which is a continuation of Ser. No. 563,143, June 6, 1966, abandoned. This application March 15, 1971, Ser. No. 124,599
Int. Cl. G08g 1/01
U.S. Cl. 340—31 R 17 Claims



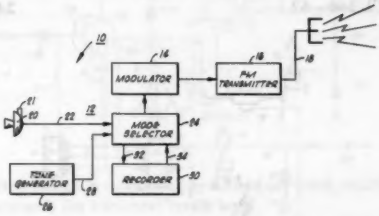
The presence of traffic in at least one of the intersecting passageways is monitored by developing a presence signal so long as a vehicle is present in a predetermined area and the presence signal is utilized to control the energization of a traffic signal light so as to initiate termination of a go signal display for traffic in the passageway which previously had right-of-way. Traffic presence detectors are provided also within the intersection itself to prevent yielding right-of-way to traffic in an intersecting passageway until the vehicle has left the intersection.

3,710,313

EMERGENCY WARNING SYSTEMS

Pleasent P. Kimball, 583 Market Street, San Francisco, Calif.; Robert H. Hagey, and Malcolm J. Macaulay, both of 6305 North Villa, Apt. 23, Oklahoma City, Okla.

Filed Jan. 13, 1971, Ser. No. 106,170
Int. Cl. G08g 1/00
U.S. Cl. 340—33 7 Claims



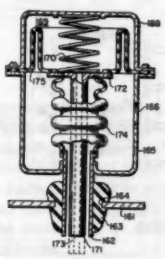
Communications warning apparatus of the type wherein a transmitter is mounted in an emergency vehicle and one or more frequency-adaptive receivers are mounted in other vehicles. This system utilizes an FM transmitter coupled with recorder and play back mechanism in the emergency vehicle so that transmission can be effected in any of three modes, i.e. modulated C-W, voice transmission or repetitive recorded voice message, and transmission is effected at such frequency that all surrounding vehicles having a required receiver instrument will receive such warning or message preferentially over a receiver instrument or modular adapter utilized with a standard car radio.

3,710,314

APPARATUS FOR DETECTING DEVIATION IN TIRE PRESSURE

Alfred S. Bell, 8375 Elmgrove Drive, Baton Rouge, La., and Fred L. Churchman, 2820 Alaska St., Baton Rouge, La.

Filed March 12, 1971, Ser. No. 123,624
Int. Cl. B60c 23/00
U.S. Cl. 340—58 5 Claims



Apparatus for detecting deviation from desired normal tire pressure range and for establishing a signal which can be readily transmitted to a vehicle operator while the vehicle is moving. The detecting apparatus is positioned within the tire space and is attached to the wheel rim. The detector includes one or a pair of variable volume chambers, each chamber having a moveable wall to which is operatively connected a rod element. The chamber has a normal volume position established by a normal difference between tire pressure and atmospheric pressure, and by spring action thereon. Upon a tire pressure deviation from normal, the chamber volume is diminished and the rod element is caused to protrude a short distance through the wheel rim, and in such position gives a visible indicia of deviation and also is adapted to actuate a switch establishing an alarm circuit including means to alert the vehicle operator. Preferred embodiments utilize two chambers to detect pressures below or above desired tire pressure. A special switch for the alarm circuit is disclosed.

3,710,315
STOP-LIGHT FOR MOTOR VEHICLES

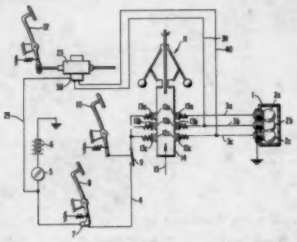
Hans O. Scherenberg, Stuttgart-Heumaden, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed March 18, 1969, Ser. No. 808,080

Claims priority, application Austria, March 18, 1968, A 2645/68

Int. Cl. B60q *1/44*

U.S. Cl. 340—62 **24 Claims**



A stop-light system for motor vehicles for providing a variable light indication to the operator of a trailing vehicle including means responsive to the driving velocity and applied brake pressure for controlling the energization of the stop-lights to provide a variable light indication which varies from a weak to a strong indication with decreasing driving velocity and/or increasing brake pressure. The variable light indication is in the form of an increase in the lighted-up surface and/or an increase in the intensity of the stop-lights.

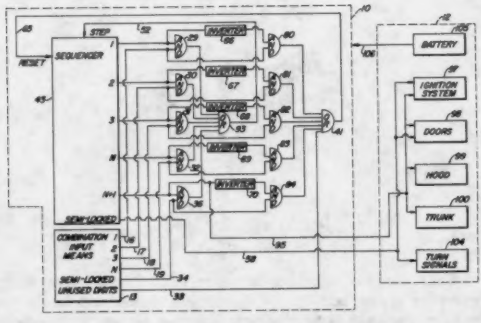
3,710,316
VEHICLE ELECTRICAL COMBINATION LOCK

George L. Kromer, 890 Ridge Road, Hickley, Ohio

Filed Sept. 1, 1971, Ser. No. 176,859

Int. Cl. B60r *25/10*

U.S. Cl. 340—63 **26 Claims**



An electrical combination lock circuit providing output signals representing locked, unlocked and semi-locked states. An "unlocked" signal is produced by providing input signals in proper sequence representing the unlocking combination. The "semi-locked" signal is produced only by providing an appropriate input signal when the combination lock circuit is in the "unlocked" state. The semi-locked state may be used to allow limited access to the protected area. Provision of an input signal representing a digit that is out of sequence in the combination or that is not in the combination causes the circuit to return to the "locked" state. In each of the locked, unlocked and semi-locked conditions the lock circuit provides a momentary electrical signal, a continuous electrical signal and a contact closure or "continuity" state for use by external locking devices. The electrical combination lock has particular advantage in protecting an automobile. In the semi-locked condition limited use of the automobile is permitted, such as by a parking lot attendant. Multiple sets of combination input means may be employed to provide access to individual areas only such as to the ignition system, trunk or doors of an automobile.

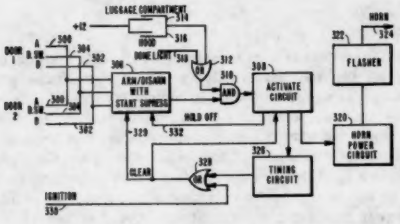
3,710,317
AUTO ALARM SYSTEM

Frank Thomas Colsen; Peter Kaufman, and Robert L. Townsend, all of Santa Barbara, Calif., assignors to Educated Vehicle Systems, Inc., Santa Barbara, Calif.

Filed May 19, 1971, Ser. No. 144,810

Int. Cl. B60r *25/00*

U.S. Cl. 340—64 **12 Claims**



An automobile alarm system is activated by locking either of the front doors or key locked opening with the door/ignition key, said system including an armable electrical circuit for powering any automotive lights and/or horn, said armable circuit having an armed and disarmed mode, an arming circuit, and a disarming circuit, said arming and disarming circuits being closed by switches activated by said key to cause a momentary current to pulse said armable circuit into either the armed or disarmed mode, said armable circuit, when in the armed mode, being triggered by at least one automotive courtesy or dome light switch, hood switch or trunk switch to complete the circuit allowing current to flow through said circuit to said automotive lights and/or horn.

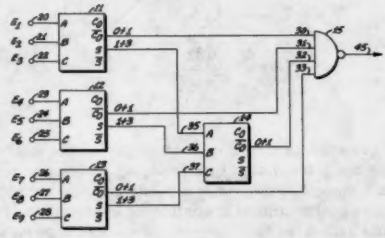
3,710,318
ERROR DETECTION CIRCUIT

William C. Powell, deceased, late of Oklahoma City, Okla. (by Joan E. Powell, administratrix), assignor to Honeywell Information System Inc., Waltham, Mass.

Filed Nov. 22, 1971, Ser. No. 200,801

Int. Cl. H03k *13/32, 19/44*

U.S. Cl. 340—146.1 AB **2 Claims**

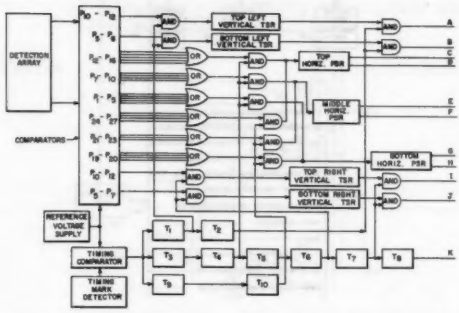


A logic circuit having nine input terminals uses four full adders and a NAND-gate to provide an output signal when signals are applied to any two or more of the input terminals.

3,710,319
OPTICAL CHARACTER RECOGNITION SYSTEM

Robert Pincus Miller, Spring Valley; Abraham Badian, New City, and Samuel P. Dickstein, Monsey, all of N.Y., assignors to Scanamation Corporation, Riverside, Conn.

Filed June 5, 1970, Ser. No. 43,670
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3 J 5 Claims



An optical character recognition system utilizes a reflecting data card including one or more fonts for the entry of one of a plurality of optically recognizable characters. The card also includes one or more non-reflecting timing marks for indicating the position of these fonts. Conventional means are used for passing these data cards at a predetermined speed past an array of one or more columns of optical comparators and a light source adapted to shine light into the cards so that it will reflect onto the array. Each comparator is adapted to produce a voltage pulse in response to a drop in the intensity of reflected light. In addition, a timing comparator is provided for detecting the timing marks and thereby triggering one or more timing pulse sources.

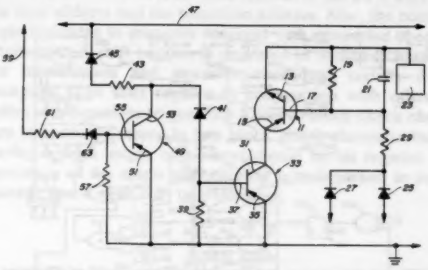
The outputs of the comparators and the timing pulse sources are combined in suitable logic circuitry for recognizing a character printed on the font. Specifically, one or more logical AND circuits are provided for combining the outputs of one or more comparators past which a vertical line will pass. Also applied to the AND circuit is the output of a timing pulse source adapted to pulse while light from a predetermined portion of the font is reflected onto the array. In addition, one or more logical OR circuits are provided for combining the outputs of one or more comparators past which a horizontal line printed on a font will pass. The output of each OR circuit is then combined with the output of a timing pulse source adapted to pulse while light from a predetermined portion of the font is reflected onto the comparator array. Requisite storage units are provided, and the information as to the presence or absence of line segments in the various predetermined font segments is fed into a decoder which then determines the character printed in the font.

3,710,320
ADDITIONAL CREDIT REQUIRED INDICATOR IN VENDING MACHINE

Thomas P. Jachimek, Evergreen Park, Ill., assignor to The Seeburg Corp., Chicago, Ill.

Filed Sept. 11, 1970, Ser. No. 71,616
Int. Cl. G07f 9/08; H03k 17/00, 19/00
U.S. Cl. 340—149 R 5 Claims

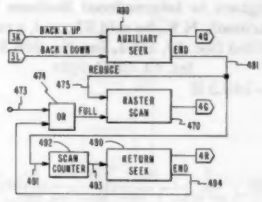
An indication is provided that more credit must be established after a customer establishes some credit below a predetermined minimum credit level. A silicon controlled switch is activated to produce the indication upon establishment of credit less than the minimum credit level. The silicon controlled switch is subsequently turned off when established credit exceeds the minimum credit level.



3,710,321
MACHINE RECOGNITION OF LEXICAL SYMBOLS

David A. Rubenstein, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 18, 1971, Ser. No. 106,971
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3 15 Claims



A raster scan covers areas containing major characters of an alphabet. When a character is recognized as being one which may have an associated diacritical mark, the scan is shifted to a separate area, the contents of which are recognized from among a group of such marks. The major-character recognition unit is disabled during scanning of the diacritical marks, and vice versa. The areas may be defined on a document by rows of rectangular boxes.

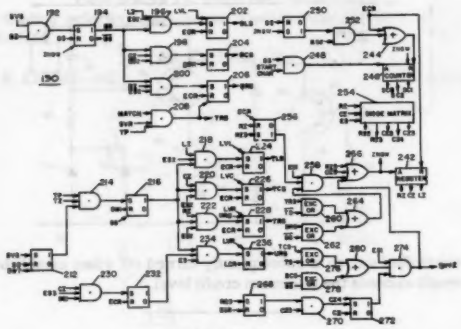
3,710,322
CHARACTER READER EXHIBITING ON-THE-FLY RECOGNITION TECHNIQUES

I. John Prickett Beltz, Willingboro, N.J., and Harold Burtis Currie, Moorestown, N.J., assignors to Orbital Systems Inc., Moorestown, N.J.

Filed March 29, 1971, Ser. No. 129,042
Int. Cl. G06k 9/13
U.S. Cl. 340—146.3 J 7 Claims

A character reader incorporates on-the-fly recognition techniques to recognize characters printed on documents. Recognition is dependent upon dividing the characters into a first plurality of horizontal zones as well as a pair of vertical zones to determine from which portion of a character certain selected features are derived. To eliminate ambiguities that may occur with such zoning techniques when poorly printed characters are read, the character reader also effectively di-

vides each character into a second plurality of horizontal zones that overlay and are substantially broader than the first

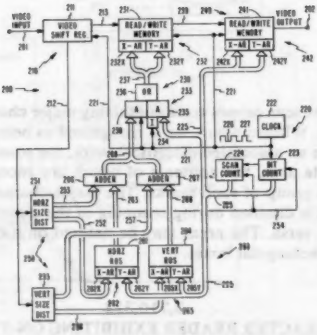


plurality of horizontal zones. Certain other selected features are read from the second plurality of horizontal zones.

3,710,323
PATTERN-SIZE NORMALIZING FOR RECOGNITION APPARATUS

Douglas R. Andrews, deceased, late of Rochester, Minn. (by Marjorie E. Andrews), and Milton J. Kimmel, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y., by said Kimmel, a part interest

Filed Dec. 13, 1971, Ser. No. 206,989
Int. Cl. G06k *9/04*
U.S. Cl. 340—146.3 H **15 Claims**

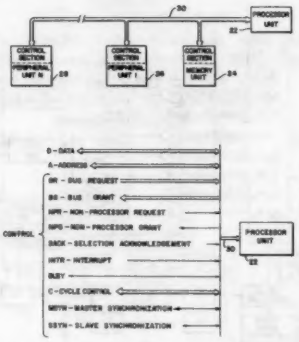


The height and width of a binary input pattern are measured and the pattern is loaded into a read/write memory. The height and width signals select stored vertical and horizontal normalization vectors which address specific locations in the read/write memory so as to transfer certain of the input-pattern bits to an output memory for subsequent recognition. Each normalization vector has a series of digits for specifying addresses within the read/write memory. Horizontal and vertical registration signals may also be combined with the normalization-vector elements to modify the selected read-write memory locations, in order to move the input pattern to a reference location in the output memory.

3,710,324
DATA PROCESSING SYSTEM

John B. Cohen, West Acton; Paul E. Janson, Boston; Harold L. McFarland, Jr., Concord, and James B. Young, Jr., Carlisle, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed April 1, 1970, Ser. No. 24,636
Int. Cl. G06f *3/04, 9/18*
U.S. Cl. 340—172.5 **27 Claims**

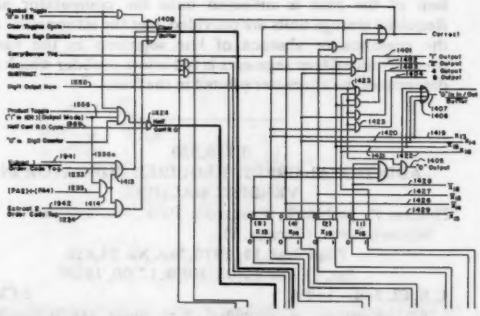


A data processing system with improved data transfer capabilities. All units in the system, including a random access memory unit, are connected in parallel. Data is transferred between any two units asynchronously with respect to a processor unit which normally controls the system. Other units can obtain system control by making a request which is honored if it has sufficient priority. Transfers requiring processor unit operation are made after an instruction is processed and may divert the processor unit to an interruption routine. Other transfers can be made whenever another unit in the system is not making a transfer. System control is returned to the processor unit or another peripheral unit when the data transfer is completed. If an interruption routine is to be executed, control is returned to the processor directly. Data transfers are controlled by synchronization signals from the controlling peripheral unit and the other unit involved in the transfer.

3,710,325
PLUGBOARD SELECTION OF REGISTER ORDERS FOR EXTRACTION OF CONTENTS

Winsor Soule, Jr., 611 Cragmont Avenue, Berkley; John Efstathiou, 6767 Sims Drive, Oakland, and Leif Andreasen, 6133 Bellhaven Ave., Newark, all of Calif.

Division of Ser. No. 434,265, Feb. 23, 1965, Pat. No. 3,522,416. This application March 24, 1970, Ser. No. 24,905
Int. Cl. G06f *9/00, 15/00*; G06k *15/00*
U.S. Cl. 340—172.5 **6 Claims**

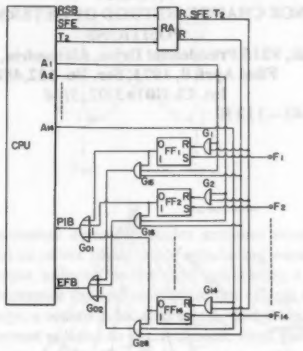


Controls for extracting digits of a register's contents before transfer to a utilization device by use of a plugboard in conjunction with the usual digit position identification signals.

3,710,326
PREFERENTIAL OFFERING SIGNAL PROCESSING SYSTEM

Kazuo Nezu, and Yutaka Tochitani, both of Tokyo, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed June 12, 1970, Ser. No. 45,729
Int. Cl. G06f 9/00
U.S. Cl. 340—172.5 8 Claims

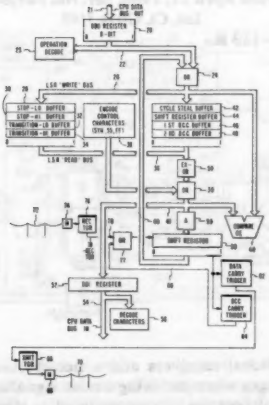


A system for feeding offering (input) signals from a plurality of groups of offering (input) terminals to a CPU. A control circuit is associated with each terminal and these control circuits are divided into groups corresponding to the terminal. The groups of control circuits are selectively fed select signals and the CPU sends out polling signals sequentially to the control circuits of each group. Each of the control circuits contains an AND circuit which is enabled to pass a signal to the CPU when its control circuit receives a polling and a select signal along with an offering signal at its associated terminal.

3,710,327
SYNCHRONOUS COMMUNICATIONS ADAPTER

Arlen K. Books, and James W. Froemke, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1970, Ser. No. 97,699
Int. Cl. G06f 11/00
U.S. Cl. 340—172.5 7 Claims

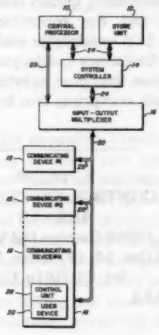


A synchronous communications adapter for connecting a CPU with a transmission line including a pair of stop buffers which together contain a 16 bit stop address and a pair of transition buffers which together contain a 16 bit transition address and compare logic of a length equal to the length of only one of the buffers which is multiplexed so as to compare a current address in the local store register to the CPU with both the stop address and the transition address. Also, the compare logic functions to compare received with generated checking characters. A shift register is provided to serialize characters for transmission and assemble characters serially during reception. The shift register in conjunction with other circuitry also functions to generate a pair of block check characters temporarily stored in two block check character buffers having a total length of a conventional 16 bit register. The operation of the single shift register is multiplexed in such a manner that it need only be 8 bits long.

3,710,328
METHOD AND APPARATUS FOR COMMUNICATING DEVICES EACH PERFORMING PREPROCESSING OPERATIONS ON DATA AUTONOMOUSLY OF THE CENTRAL PROCESSOR

John C. Hunter, Phoenix, Ariz., and Albert L. Beard, Phoenix, Ariz., assignors to Honeywell Information System Inc., Waltham, Mass.

Filed Jan. 21, 1971, Ser. No. 108,284
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 10 Claims



Communicating devices in a data processing system operate in a data-altering mode to perform processing operations autonomously of the central processor. The operations are performed within limits prescribed by broad-function parameters from the central processor, thus relieving the central processor of preprocessing operations. Each device issues discrete instructions comprising an operation part and a store address part for performing operations on data items supplied by the device itself, as well as on data in the system store.

ERRATA

For Classes 340—112.5 thru 340—379 see:
Patents Nos. 3,710,348 thru 3,710,379

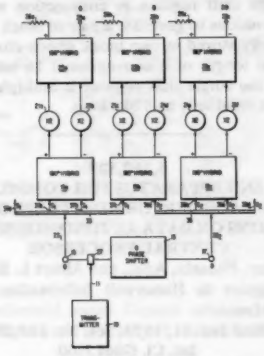
3,710,329
PHASE CONTROL CIRCUITS USING FREQUENCY MULTIPLICATION FOR PHASED ARRAY ANTENNAS

Robert J. Mailloux, Wayland, Mass., and Paul R. Caron, Tiverton, R.I., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed July 16, 1970, Ser. No. 55,333
Int. Cl. H01q 3/26
U.S. Cl. 343—100 SA 13 Claims

The disclosure describes a phase control coupling circuit for use with a phased array antenna. The coupling circuit includes

a combining circuit which is coupled to a transmission line, a frequency multiplier circuit which is coupled to the combining circuit, and a recombining circuit which is coupled between the frequency multiplier circuit and phased array antenna elements. In a "doubler" embodiment, the frequency multiplier circuit comprises frequency doublers and the combining and recombining circuits comprise four-port hybrid power dividers. In a generalized embodiment, the multiplier circuit



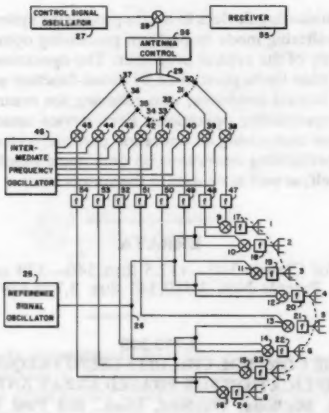
comprises frequency multiplier elements which multiply to the *N*th power, the combining circuit comprises four-port hybrid power dividers, and the recombining circuit comprises summing circuits. In a quadrupler embodiment, the multiplier circuit comprises frequency quadrupler elements, the combining circuit comprises four-port hybrid power dividers and the recombining circuit comprises two levels of four-port hybrid power dividers.

3,710,330

SCALED SCAN CONTROL SYSTEM FOR CONFORMAL ARRAYS

Glenn A. Walters, 12900 Camino Del Valle, Poway, Calif.

Filed Oct. 14, 1970, Ser. No. 80,670
Int. Cl. H01q *3/26*
U.S. Cl. 343—100 SA **9 Claims**



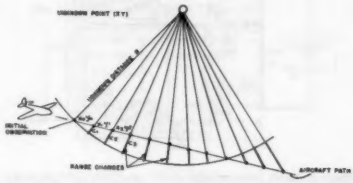
The radiation pattern of a conformal, quasi-uniform distribution of elements, each containing a radiating aperture, mixer and possible other active and passive components, is controlled by controlling the phase-amplitude characteristics of signals applied to the elemental mixers. The phase-amplitude characteristics of the control signals are derived from a scaled array wherein individual elements are arranged in accordance with those of the operational conformal array. The scaled system is illuminated by an electromagnetic or acoustic beam having the desired radiation pattern and the characteristics of the elemental signal within the elements of the scaled array control the radiation pattern of the conformal array in the desired manner.

3,710,331

RANGE CHANGE METHOD OF DETERMINING POSITIONS

Allan Kilsk, 9215 Presidential Drive, Alexandria, Va.

Filed April 8, 1971, Ser. No. 132,458
Int. Cl. G01s *5/02, 5/14*
U.S. Cl. 343—112 R **20 Claims**



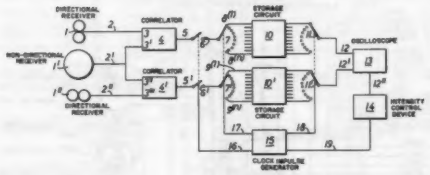
A method and apparatus for determining coordinates of unknown ground positions and positions of objects above the earth's surface by the use of code-modulated radio signals in conjunction with stable oscillators. An aircraft transmits a signal which is acquired and tracked by known and unknown ground stations. Range changes are obtained from the measurements of the phase shift between the received signal and an internal reference signal. From the large number of range change measurements obtained as the aircraft moves with respect to the ground positions, the positions of the aircraft as well as the positions of the unknown points are computed by solving large groups of equations simultaneously.

3,710,332

METHOD AND APPARATUS FOR FINDING THE DIRECTION OF SIGNALS

Horst Tischner, Hannover; Alfred Schief, Beethovenstr. 16, Eningen, and Hugo Baur, Tubingen, all of Germany, assignors to Federal Republic of Germany as represented by the Federal Defense Minister, Bonn, Germany

Filed April 21, 1966, Ser. No. 545,801
Int. Cl. G01s *3/46*
U.S. Cl. 343—113 R **22 Claims**

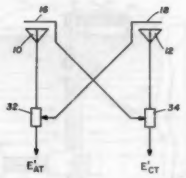


Two directional receivers and a non-directional receiver produce voltages when receiving a main signal and interfering signal. The voltages are cross-correlated so that the resultant voltages are functions of the angle between the direction of the main signal and a reference line, and can be evaluated to determine the direction of the main signal.

3,710,333
INTERFEROMETER DIRECTION FINDER ANTENNA COMPENSATION

Carol L. Crom, Garland, Tex., assignor to E-System, Inc., Dallas, Tex.

Filed Sept. 27, 1971, Ser. No. 184,114
Int. Cl. G01s 3/10
U.S. Cl. 343—114 7 Claims

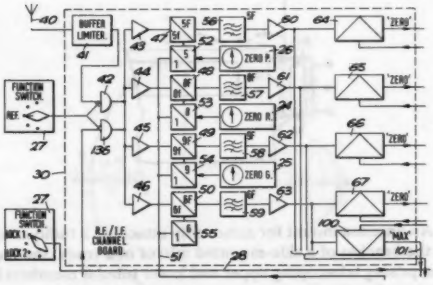


An interferometer direction finder antenna mounted in a protective pod receives phase error producing energy resulting from current induced in the pod generating a magnetic field. To compensate for and minimuze the effects of this extraneous energy, a sensor is located on the pod and oriented to produce a current related to the magnetic field generated by the pod current. A direction finder system employs at least two radio wave energy responsive antennas and each of the antennas has associated therewith a separate sensor. To minimize the pod current error in the wave front signal a current from the sensor associated with the first antenna is combined with a wave front signal from the second antenna. Similarly, the current signal from the sensor of the second antenna is combined with the wave front signal from the first antenna. Signals from each of the combining circuits are used in standard direction finder computing receivers to determine the location of a transmitting source relative to the direction finder antennas.

3,710,334
RECEIVERS FOR PHASE COMPARISON RADIO NAVIGATION SYSTEMS

Brian Pace, London, England, assignor to Decca Ltd., London, England

Filed Nov. 9, 1970, Ser. No. 88,036
Claims priority, application Great Britain, Nov. 10, 1969, 54,970/69
Int. Cl. G01s 1/30
U.S. Cl. 343—105 R 6 Claims

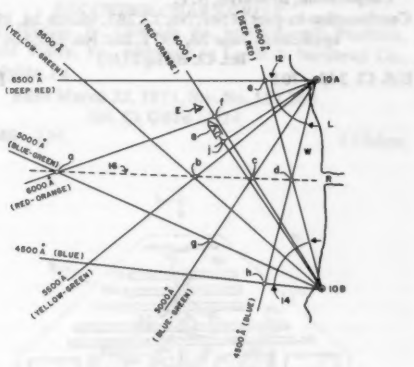


In a phase comparison radio navigation receiver in which fine readings of phase relationship between signals of different but harmonically related frequencies normally radiated from fixed transmitters are indicated on meters with pointers traversing a circular scale and in which mechanical integration of the pointer movements is used for lane indication, there is provided a digital indicator using a digital counter and clock pulse source for determining the phase relation between an oscillator output and fundamental frequency signals derived from short duration multiple frequency transmissions which are radiated from one station at a time for short periods, the oscillator being phase locked to a signal derived from the signals normally radiated from one of the stations.

3,710,335
AZIMUTHAL POSITIONING SYSTEM

Larry K. Lepley, 3434 C Kalihi Street, Honolulu, Hawaii

Filed May 20, 1970, Ser. No. 38,924
Int. Cl. G01s 3/02, 1/08
U.S. Cl. 343—112 R 13 Claims

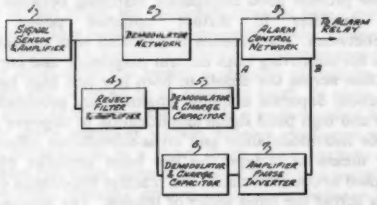


A navigation system for providing location information by triangulation, comprising at least two optical or radio or acoustic beacons spaced apart at predetermined locations, each beacon being fixed to project a frequency-dispersed spectrum in an azimuthal arc about the beacon, the arcs from the spaced beacons overlapping in the navigational area of interest, and means for identifying and comparing the frequency received from each of the beacons at any point in the area of overlap of the arcs, including an area chart showing the beacon spectra, and necessary receiving instrumentation in some embodiments.

3,710,336
SIGNAL-RESPONSIVE CONTROL SYSTEM

Julius O. Lerner, Verona, N.J., assignor to David Herman, Livingston, N.J., a part interest

Filed Oct. 2, 1969, Ser. No. 863,258
Int. Cl. G08b 13/22
U.S. Cl. 343—225 4 Claims



An actuating system responsive to a predetermined frequency includes a network for preventing actuation by noise, unauthorized, or spurious signals, which network includes a filter which passes frequencies in other than the predetermined frequency. The filter passed signal is demodulated and applies as a disabling signal to the system actuator

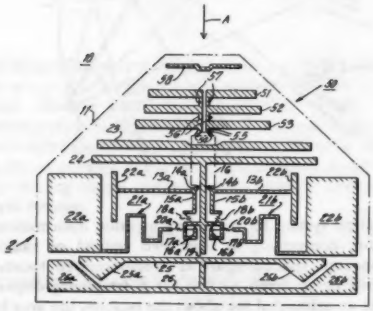
network. Where the system is a sonic type intruder detector the filter-passed signal is also demodulated by a second rectifier and charges a capacitor whose output is applied to the actuator network and after a predetermined charging interval is sufficient to trigger the network. In a door or function actuating system, the actuator network is disabled by a signal of other than the predetermined frequency for an extended interval following its application.

3,710,337

MINIATURE TV ANTENNA

Ronald D. Grant, Urbana, Ill., assignor to JFD Electronics Corporation, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 22,281, March 24, 1970. This application June 28, 1971, Ser. No. 157,106
Int. Cl. H01q 21/12
U.S. Cl. 343—701 **18 Claims**



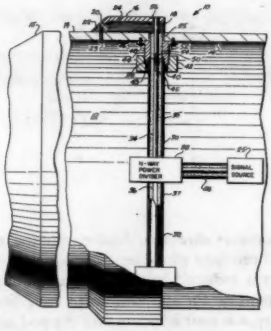
An antenna for TV reception predominantly in the low band and high band VHF ranges having dipoles of significantly reduced physical length as compared with conventional dipoles for reception in the above mentioned VHF ranges. Inductive elements are employed as an integral part of at least one of said dipoles for improving the bandwidth and raising the Q of the dipole. The dipoles are electrically isolated from one another by suitable frequency sensitive circuits to isolate high band operation from low band operation. Lossy components are also provided as an integral part of at least one of the dipole sections for significantly enhancing power transfer between the antenna and amplifier. The inductive elements further provide good impedance matching between antenna and amplifier to further optimize power transfer therebetween. The antenna is provided with capacitive end loads for improving both current magnitude and current distribution across the dipole in both low and high band VHF operation. Separate amplifier channels are provided for low band and high band signal amplification to improve gain and reduce intermodulation and cross-modulation effects. Input filter means in at least the low band amplifier channel is designed to counterbalance the reactive impedance of the antenna across the band width of interest. The antenna is contained within a lightweight weather-proof housing of simplified design which further facilitates handling and assembly. The antenna itself is lightweight, preferably being comprised of active and parasitic elements, deposited or otherwise formed upon a thin flexible insulating substrate. The two channel amplifiers are mounted directly upon the antenna and are contained within the lightweight antenna housing.

3,710,338

CAVITY ANTENNA MOUNTED ON A MISSILE

Robert E. Munson, Boulder, Colo., assignor to Ball Brothers Research Corporation, Boulder, Colo.

Continuation of Ser. No. 787,912, Dec. 30, 1968, abandoned. This application Dec. 30, 1970, Ser. No. 102,983
Int. Cl. H01q 1/28
U.S. Cl. 343—708 **7 Claims**



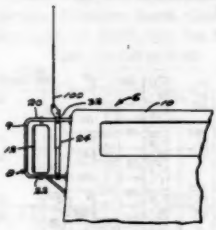
An antenna for use on a missile wherein a cylindrical conductor is concentrically positioned about a metallic surface portion of the missile so as to define a cavity of one-quarter wavelength between one end of the cylindrical conductor, which is connected with the missile surface, and a plurality of connecting positions of energy transfer means. The energy transfer means is connected about the periphery of the cylindrical conductor at intervals substantially equal to a single wavelength of a signal so that the cylindrical conductor and the missile surface adjacent an opposite end of the cylindrical conductor form the elements of an asymmetric dipole of high impedance.

3,710,339

PORTABLE ANTENNA MOUNT FOR TRUCKS

Leroy A. Rima, 10628 Boyd Street, Omaha, Nebr.

Filed March 24, 1971, Ser. No. 127,572
Int. Cl. H01q 1/32
U.S. Cl. 343—715 **9 Claims**



An antenna mount for removably attaching a radio antenna to the bracket of a side-mounted mirror of a truck, the mount comprising telescoping upper and lower tubular members having a spring therein, means attaching hooks to each member so that said spring causes said hooks to clamp against outwardly extending portions of said mirror bracket, an antenna of a vertically telescoping type folding into a collapsed position with respect to the telescoping tubes for compact storage.

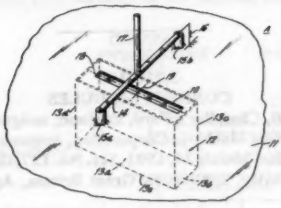
The combination described in further combination with a truck and truck mirror having outwardly extending bracket portions.

3,710,340

SMALL, BROADBAND, UNIDIRECTIONAL ANTENNA

Paul E. Mayes, Champaign, Ill., assignor to JFD Electronics Corp., Brooklyn, N.Y.

Filed Oct. 13, 1971, Ser. No. 188,711
Int. Cl. H01q 21/00
U.S. Cl. 343—725 14 Claims



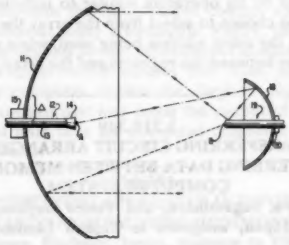
A non-resonant antenna structure for the reception and/or radiation of electromagnetic waves in a unidirectional manner over a broad frequency band. The structure consists of two resonant elements of dual type fed simultaneously from the same transmission line. The resonant elements are adjusted so that the image impedance of the composite two-port structure is nearly constant and resistive over a very wide frequency band. One port is terminated in a resistor approximately equal in value to the image impedance. As a result, the impedance observed at the other port is also very nearly a constant resistance. In a given plane through the antenna one element has an omnidirectional radiation pattern; the other, a typical figure-of-eight dipole pattern. Proper adjustment of feeder impedance relative to the impedances of the individual elements leads to a unidirectional pattern with high front-to-back ratio over the operating band. Since achievement of the above conditions is possible at frequencies below the first resonant frequency of either element, the antenna dimensions may be small compared to the wavelength, particularly at the lower end of the operating band.

3,710,341

GREGORIAN ANTENNA WITH RING FOCUS

Attilio F. Sciambi, Jr., Melbourne, Fla., assignor to Radiation Inc., Melbourne, Fla.

Filed March 17, 1971, Ser. No. 125,265
Int. Cl. H01q 19/14
U.S. Cl. 343—779 9 Claims



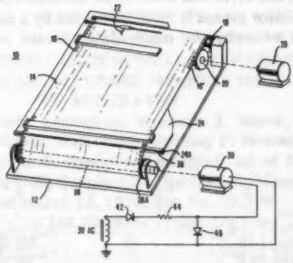
A Gregorian antenna system has the usual main reflector, subreflector, a first feed for illuminating the main reflector from the virtual focus via the subreflector, and a second feed for directly illuminating the main reflector from a prime focus. The second feed is shaped, and is positioned relative to the subreflector, to create a ring focus for energy reflected from the subreflector to the main reflector, and the main reflector is shaped to have the ring focus as its prime focus.

3,710,342

RECORDER CHART DRIVE

Thomas T. Highley, Jr., Glenside, Pa., and Albert E. Paschkis, Gwynedd Valley, Pa., assignors to Leeds & Northrup Co., Philadelphia, Pa.

Filed March 22, 1971, Ser. No. 127,262
Int. Cl. G01d 15/24
U.S. Cl. 346—136 4 Claims



A recorder of the type for recording one or more records of the value of one or more conditions under measurement such as temperature, pressure, flow or the like upon a strip chart. A pen, pens, a stylus, stylii, or a printwheel in the case of multipoint recorders, is utilized to make a record of a condition or conditions on the chart; the recording element being moved across the chart to a position corresponding to the value of a condition. The chart is generally driven at a constant speed by means of a chart drive roll having a plurality of radially extending pins also referred to as sprocket teeth. In some instances in place of the drive roll there is a back-up plate having one or more sprocket wheels suitably displaced with respect to perforations in a chart. Such charts include adjacent at least one edge thereof a row of holes in a marginal area of the chart whereby driving engagement between the chart and the teeth or pins of the driving means cooperate to draw the chart from a supply roll passed the record applying means. The chart is thereafter drawn across a chart back-up plate by a reroll mechanism. In recorders of this type the reroll mechanism is driven slightly faster than the chart drive means either by utilizing a single motor and a chain or belt type of

connection or by a separate motor. In the preferred form of applicants' invention the reroll is driven intermittently in a manner to prevent the holes in the chart from creeping off the pins of the drive means and/or jamming and/or tearing of the chart. Additionally, the intermittent reroll action permits edge guiding of the rerolled chart by the reroll flange to be fully effective.

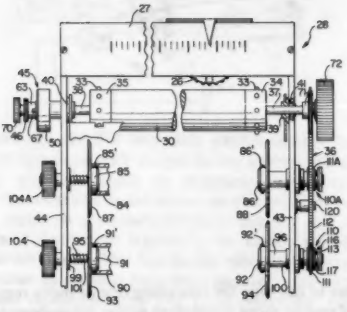
3,710,343

STRIP CHART DRIVE MECHANISM FOR A RECORDER

Werner R. Bauer, Radnor, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 13, 1971, Ser. No. 188,843
Int. Cl. G01d *15/24*
U.S. Cl. 346—136 **20 Claims**

In a multipoint recorder having a movable strip chart for recording purposes and marking means for marking on said chart as said chart is being moved by chart drive means wherein the chart drive means comprises a strip chart supply roll, a chart drive roll and a chart take-up roll with the chart being fed from the supply roll around part of the drive roll and on to the take-up roll, the improvement wherein a drive gear is coupled by a coupling that interconnects the drive gear to the drive roll without slippage therebetween when the coupling is in a locked position thereof and that disconnects the drive gear from the drive roll when in an unlocked position thereof. A manipulator means is interconnected by a slip clutch to the drive roll whereby the manipulator means cannot turn the drive roll independently of the drive gear unless the coupling is in the unlocked position thereof.



3,710,344

Patent Not Issued For This Number

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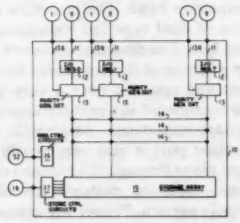
3,710,348

CONNECT MODULES

David J. Craft, Chandler's Ford, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed March 24, 1971, Ser. No. 127,487
Claims priority, application Great Britain, April 2, 1970, 15,553/70
Int. Cl. G06f *13/00*
U.S. Cl. 340—172.5 **11 Claims**



A connect module (carried by a single structure with control and data input-output pins) interfaces between functional memory stores and conventional components such as main store, to provide data funnelling and parity checking in systems generally of the type shown in copending U.S. application of P.A.E. Gardner et al.; Ser. No. 828,503, filed May 28, 1969 now U.S. Pat. No. 3,585,605. A module comprises buses, data registers, parity checkers continuously checking data in the registers, highways whereby any register can be connected to any other register and a storage array between which array and any data register data can be transferred. Additional functions such as the selective inversion of data can be obtained with the same pin count by making the module interpretive. Such a module has a control register into which data from the array can be transferred.

In each module cycle two addresses are defined, a direct address which is explicitly given and a conditional address which is generated by an operation similar to indexing. Either address can be chosen to select from the array the control word for a cycle, the other address being used, when required for a data transfer between the registers and the array.

3,710,349

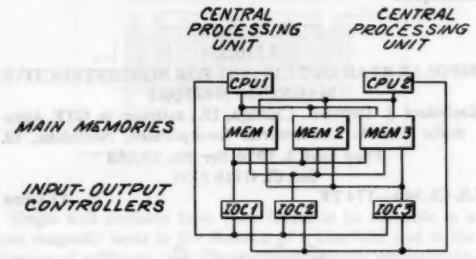
DATA TRANSFERRING CIRCUIT ARRANGEMENT FOR TRANSFERRING DATA BETWEEN MEMORIES OF A COMPUTER SYSTEM

Osamu Miwa, Sagamihara, and Yosiro Kayano, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 827,316, May 23, 1969, abandoned. This application May 5, 1971, Ser. No. 140,601
Claims priority, application Japan, May 25, 1968, 43/35407
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 **1 Claim**

Data transferring means separate and independent from the central processing unit of a computer system and operating in

parallel with the central processing unit transfers data between a first memory area and a second memory area in a memory. The data transferring means comprises a first register for storing the address of the data of the first memory area from which the data is successively transferred to the second memory area. A second register stores the address of the data of a second memory area to which the data is successively transferred from the second memory area. A third register stores addresses of the group of data transferred from the first memory area to the second memory area. Transfer means transfers data directly to the second position in the

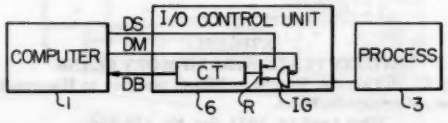


second memory area designated by the address information of the second register. First arithmetic means connected to the first register and the second register modifies the address information of the first register and the second register by the information of the transfer data. Second arithmetic means connected to the third register modifies the address information of the transfer data.

3,710,350
SYSTEM FOR DIAGNOSING AN INPUT-OUTPUT CONTROL UNIT

Norito Yoshitake, Kawasaki, and Ryoji Imazeki, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki-shi, Japan

Filed June 18, 1971, Ser. No. 154,497
Claims priority, application Japan, June 22, 1970, 45/54250
Int. Cl. G06f *11/00*
U.S. Cl. 340—172.5 **6 Claims**



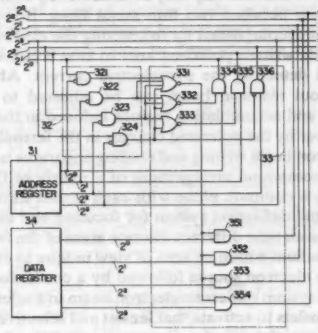
A system according to the present invention diagnoses an input-output control unit in the computer control system comprising a computer, the input-output control unit and a process. The diagnoses is carried out without separating the connections between the input-output control unit and the process and without using a simulator. Firstly, the diagnose mode signal is applied to the input-output control unit and separates this input-output control unit from the process. Secondly, the computer applies the diagnose signal to the input-output control unit and reads the output of the input-output control unit; thus the computer diagnoses the input-output control unit.

3,710,351
DATA TRANSMITTING APPARATUS IN INFORMATION EXCHANGE SYSTEM USING COMMON BUS

Hideo Nakamura, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 12, 1971, Ser. No. 188,022
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 **5 Claims**

In a system wherein a number of computers are coupled to a common bus and the communication among them is effected through the bus, a data transmitting apparatus with which, when a plurality of computers have simultaneously made requests for communication with another computer, the communication is made possible from one of the highest priority level, said data transmitting apparatus being constructed such that larger addresses in binary codes are assigned in the order

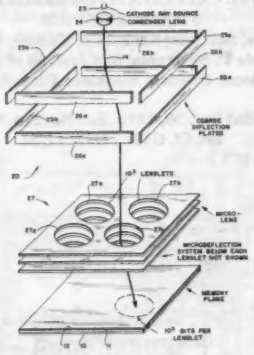


of the priority levels of data to be transmitted. The address is successively transmitted from an upper-place bit in case of transmitting it to said bus; it is compared with an address on said bus at every bit; and in the case where said address of said apparatus is "0" without coinciding with said address on said bus, said apparatus prohibits transmission of signals ob bits of lower places than the non-coincident place.

3,710,352
HIGH SPEED-LARGE STORAGE CAPABILITY ELECTRON BEAM ACCESSED MEMORY METHOD AND APPARATUS

Donald O. Smith, Lexington; Kenneth J. Harte, Carlisle; Mitchell S. Cohen, Watertown; Sterling P. Newberry, Carlisle, and Dennis E. Speliotis, Lexington, all of Mass., assignors to Micro-Bit Corporation, Burlington, Mass.

Filed March 13, 1970, Ser. No. 19,379
Int. Cl. G11c *11/22*
U.S. Cl. 340—173.2 **46 Claims**



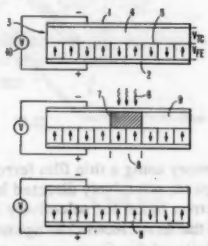
A high speed memory using a thin film ferroelectric storage medium and high speed, selectively directed heating means in the form of an electron beam for selectively heating discrete bit storage areas on the ferroelectric storage medium to a temperature in the vicinity of the Curie point, and subsequently applying a low voltage polarizing potential across the ferroelectric storage medium during cooling of the selectively heated discrete bit storage areas below the Curie point whereby polarized charges are permanently frozen into the discrete areas selectively to form unique bits of recorded information. The low voltage polarizing potential is selectively

reversible whereby different polarity charges may be formed at the selected different discrete areas on the ferroelectric storage medium. The ferroelectric storage medium preferably comprises a thin ferroelectric film, on the order of a few thousand angstroms thick which may be sandwiched between two thin metal films of several hundred angstrom units thickness, or alternatively may be sandwiched with a semiconductor layer between two thin metal films. Non-destructive read-out is accomplished by redirecting the electron-beam to a previously written polarized area to heat it below the Curie point and detecting the pyroelectric current. Alternatively, the read-out electron beam can be adjusted to probe the depletion and accumulation regions induced in the semi-conductor layer by the polarized charges in the ferroelectric film. The electron beam writing and reading apparatus is of the type having a compound arrangement of a matrix of fine lenslets arrayed in a common plane with each lenslet having its own focusing and deflection system for focusing and directing the electron beam onto different discrete areas of the ferroelectric storage medium within an area of view unique to each lenslet. A suitable electron source followed by a coarse focusing and deflection system directs an electron beam to a selected one of the fine lenslets to activate that lenslet and selectively record a bit of information on the discrete area of the ferroelectric recording medium within the unique field of view of the selected lenslet. The memory is capable of storing 10^8 bits of information in discrete areas on the order of 1 micron in diameter over the surface of a ferroelectric storage medium approximately one centimeter by one centimeter square with recording/read out speeds of at least one bit per microsecond or faster. Extremely large, storage capability memory systems may be formed with such memories having a storage capacity on the order of 10^{10} bits randomly accessible at speeds of at least one bit per microsecond by including 10^2 high speed memory units constructed in the above-described manner arrayed in a common system and having a central common controller for accessing simultaneously each one of the high speed memory units in response to instructions from a computer system input-output equipment and supplying the selected information to an output circuit for connecting the output from each of the high speed memory units to the computer input-output equipment.

3,710,353
THERMAL CAPACITATIVE-FERROELECTRIC STORAGE DEVICE

John T. Jacobs, San Jose; Kenneth L. Keester, Mountain View, and Benjamin D. Silverman, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1971, Ser. No. 214,357
Int. Cl. G11c *11/22, 11/24*
U.S. Cl. 340—173.2 34 Claims

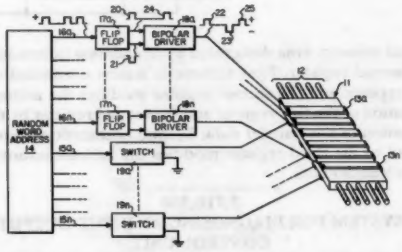


A data storage apparatus comprising a memory element having a ferroelectric region in contact with a thermal capacitive region, the thermal capacitive region being a region exhibiting a change in capacitance with a change in temperature sufficient that when a voltage is applied across a selective volume of the memory element, and energy is applied to the thermal capacitive region, a voltage transfer occurs from the thermal capacitive region to the ferroelectric region, resulting in a net voltage across the ferroelectric region capable of causing polarization reversal, or switching of the state of polarization of the ferroelectric region. By measuring current during the switching process, a determination is made whether the region was or was not switched resulting in knowledge of the prior state of polarization of the region and hence, whether a "zero" or a "one" was previously stored in the region. Reading may also be done by optical polarization reading techniques.

3,710,354
BIPOLAR READ-OUT CIRCUIT FOR NONDESTRUCTIVE MAGNETIC MEMORY

Kazimierz J. Deptuch, Chicago, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed April 2, 1970, Ser. No. 25,058
Int. Cl. G11b *5/00*
U.S. Cl. 340—174 TF 4 Claims

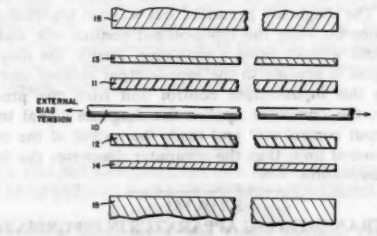


In plated wire nondestructive memory systems, memory read-out circuits include polarity reversing means. The successive pulses for different interrogations have opposite polarities to retard skew which is a gradual rotation of magnetic axis caused by successive interrogation of magnetic elements having anisotropic characteristics. The reversal of polarity on each interrogation of the same magnetic elements prolongs the retention of information in memories.

3,710,355
UNITIZED PLATE WIRE MEMORY PLANE

Gary C. McPherson, Excelsior, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed April 19, 1971, Ser. No. 135,286
Int. Cl. G11c *5/04, 11/14*
U.S. Cl. 340—174 PW 18 Claims

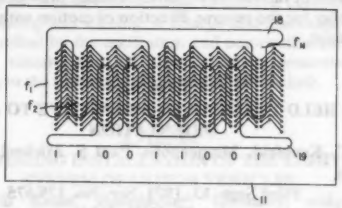


Plated wires are incorporated as an integral part of a dielectric support medium, thereby forming a plated wire memory plane. The tensile strengths or thermal coefficients of expansion of the plated wires and the dielectric support medium are so related that over a desired operating temperature range the plated wires are maintained in a relatively stress-free condition.

3,710,356
STRIP DOMAIN PROPAGATION ARRANGEMENT

Andrew Henry Bobeck, Chatham, N.J., and Robert Frederick Fisher, Livingston, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 8, 1971, Ser. No. 178,692
Int. Cl. G11c 11/14, 19/00
U.S. Cl. 340—174 TF 10 Claims

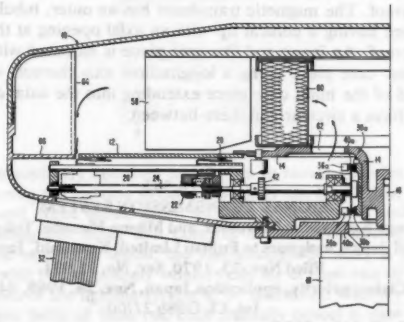


Single wall domains have been found to be movable in a host magnetic layer in the absence of a bias field and in the absence of sufficient coercivity in the host layer for maintaining the domain walls in fixed positions when drive fields terminate.

3,710,357
MAGNETIC DISK STORAGE FILE IN SEALED ENCLOSURE

Walter S. Buslik, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 2, 1970, Ser. No. 51,867
Int. Cl. G11b 5/48, 21/08
U.S. Cl. 340—174.1 C 11 Claims



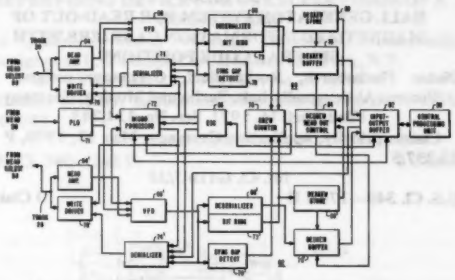
A sealed enclosure, such as used for magnetic disk packs, contains an operative disk storage file, including the magnetic heads, head carriage and actuator, and a drive shaft, as well as a magnetic recording disk. An external power source or motor is coupled to the drive shaft for rotating the disk, and for providing power for accessing the heads to circumferentially defined data tracks. A cylindrical fin structure generates an air flow for cooling, and an air filter minimizes contamination.

3,710,358
DATA STORAGE SYSTEM HAVING SKEW COMPENSATION

Abraham M. Gindi, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,868
Int. Cl. G11b 5/02
U.S. Cl. 340—174.1 B 14 Claims

A data recording system is disclosed in which skew occurring between parallel data tracks is compensated for by an arrangement which measures the skew during a given field and adjusts the size of the immediately following gap by one half the measured skew. The disclosed system comprises a magnetic disk file of the fixed head type in which opposite pairs of magnetic heads are alternatively employed to transfer data to and from a logical track comprising one half the circumference of each of a pair of circular tracks on a magnetic disk. The skew of each field within a logical track is measured and one half the measured value is, depending on the type of

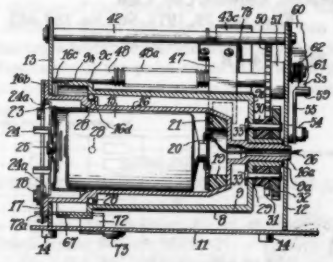


system used, added to or subtracted from the nominal size of a gap between the previous field and the immediately following field. Skew compensation is implemented by a circuit which counts bit ring cycles between occurrence of the early track and the late track, divides the resulting count by two and stores the quotient until the end of the field, and adds the stored bits to constants for the gap before turning on a write driver to update the following field in the case of a read operation or before locking a variable frequency oscillator to the data to be read in the case of a read operation.

3,710,359
WORK SAMPLER FOR MAGNETICALLY RECORDING INFORMATION IN TIME-COORDINATED BITS

Hideo Sawada; Ensei Rin, both of Kanagawa-ken; Isao Yamada; Hiroshi Mano, both of Tokyo, all of Japan, and Thomas K. McGourty, Aptos, Calif., assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Jan. 15, 1971, Ser. No. 106,708
Claims priority, application Japan, Jan. 20, 1970, 45/5581
Int. Cl. G11b 5/52, 5/74, 15/20
U.S. Cl. 340—174.1 G 10 Claims



A rotatably mounted drum driven by a clock mechanism mounts a magnetic recording sheet. A magnetic head is cooperable with the recording sheet and is arranged for connection to a magnetic recording circuit which includes a switch controlling energization of the circuit in accordance with changes in a physical state to be recorded. The clock mechanism effects relative movement of the magnetic head and the sheet in chronological sequence and includes means operable to connect the recording circuit to the magnetic

head once during each unit time interval to record information magnetically on the sheet during unit time intervals in which the circuit is energized by its control switch. The drum is rotatably mounted on a cylinder containing a dry cell serving as a source of potential for the recording circuit and for winding means of the clock mechanism. The information recorded on the recording sheet may be made available through a magnetic pickup head or through printout means.

3,710,360

HALL GENERATOR SYSTEM FOR READ-OUT OF MAGNETIZED INFORMATION CARRIERS WITH SEVERAL CODE POSITIONS

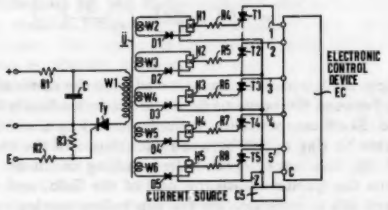
Dieter Flachsbarth, Ruckersdorf, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed April 16, 1971, Ser. No. 134,743

Claims priority, application Germany, May 13, 1970, P 20 23 237.5

Int. Cl. G11b *5/38*

U.S. Cl. 340—174.1 H **3 Claims**



A system for reading magnetized information carriers with several code positions comprises a number of Hall generators, a signal input circuit with a capacitor which has a discharge circuit connected across the capacitor and comprises a controllable semi-conductor switching member, preferably a thyristor. An inductive transformer has its primary winding connected in series with the switching member. Several secondary windings of a transformer are connected with the control-current terminals of the respective Hall generators. An electronic control device, which is to respond to the code pulses of the input circuit, is connected to the Hall electrode pairs of the respective Hall generators.

3,710,361

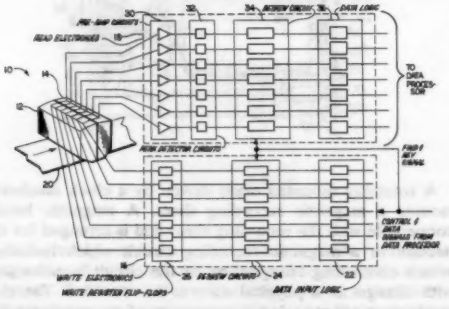
BIDIRECTIONAL DIGITAL DESKEW CIRCUIT

Charles M. Sonberg, Santa Monica, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed July 29, 1971, Ser. No. 167,402

Int. Cl. G11b *5/44*

U.S. Cl. 340—174.1 B **14 Claims**



A bidirectional magnetic information storage system includes a multi-channel read head, associated deskew compensated read circuitry, a multi-channel write head and deskew compensated write circuitry. Only one read and one write deskew circuit is required for each channel. Each digital, bidirectional circuit includes a one shot multivibrator providing a time delay determined by the time required for a capacitor to reach a selected trigger voltage as it charges through a potentiometer. When the potentiometer resistance on one side of the center tap is adjusted to provide a proper time delay for one direction of motion, the resistance on the opposite side of the center tap automatically provides the proper time delay for the reverse direction of motion without further adjustment.

3,710,362

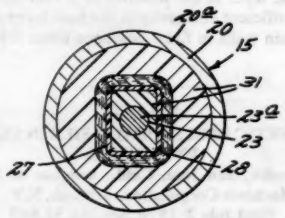
HAND HELD TRANSDUCER INSENSITIVE TO ANGULAR ORIENTATION

Alan C. Kronfeld, Minneapolis, Paul S. Michael, Excelsior, Minn.

Filed Sept. 13, 1971, Ser. No. 179,675

Int. Cl. G11b *5/24*

U.S. Cl. 10—3 **4 Claims**



A pen-like device for reading magnetically coded data is shown, having a magnetic transducer mounted at one end thereof. The magnetic transducer has an outer, tubular core piece having a conical tip with an axial opening at the apex thereof. An inner, rod-like core piece is mounted within the outer core piece along a longitudinal axis thereof, with an end of the inner core piece extending into the axial opening to form a circular gap there-between.

3,710,363

SIGNAL TRANSMISSION SYSTEM

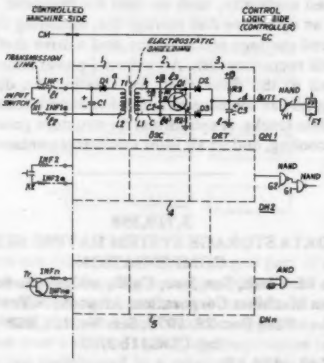
Kengo Kobayashi, Kawasaki, and Mitsuo Manabe, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 23, 1970, Ser. No. 91,991

Claims priority, application Japan, Nov. 28, 1969, 44/95542

Int. Cl. G08b *21/00*

U.S. Cl. 340—213 R **1 Claim**



Noises are generated in signal lines connecting an electronic circuit in the digital controller with a limit switch and a relay

in the controlled machine and these noises cause the electronic circuit in the digital controller to misoperate. This invention eliminates the above defect by the use of a noise filter of a simple circuit constitution, comprising an electrostatic screening type transformer, an oscillation circuit being attached to the primary winding of said transformer, current generated in the secondary winding of said transformer being rectified and converted into DC signals, said DC signals being opened and closed by a switch, the oscillation and non-oscillation of said oscillation circuit being controlled corresponding to said opening and closing, a charge-and-discharge circuit being controlled by the oscillation and non-oscillation of said oscillation circuit, and DC signals being generated corresponding to the opening and closing of said switch.

3,710,364
MONITORING INSTALLATION OF THE LIGHTING SYSTEM OF MOTOR VEHICLES

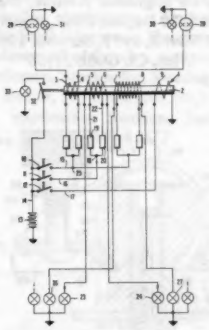
Hans-Ulrich Kuhn, Hohenacker, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Jan. 13, 1971, Ser. No. 106,038

Claims priority, application Germany, Jan. 15, 1970, P 20 01 552.5

Int. Cl. G08b *29/00*

U.S. Cl. 340—214 **4 Claims**



An electrically operated installation in motor vehicles for monitoring the lighting system, especially the headlights, tail lights and brake lights, which includes light switches and an electromagnetic relay that controls a switch producing an acoustic or optical signal; the electromagnetic relay is provided with two oppositely wound coils for at least one of the functions of the lighting system to be monitored whereby the magnetic fields of these two coils mutually cancel in case the corresponding part of the lighting system operates completely satisfactorily.

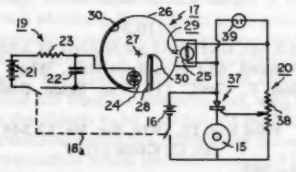
3,710,365
ELECTRONIC SMOKE DETECTOR

Forrest G. Barnes, 80 Middlesex, Swampscott, Mass.

Filed April 21, 1971, Ser. No. 135,860

Int. Cl. G08b *17/06, 17/10*

U.S. Cl. 340—237 S **2 Claims**



Detection and warning of hazardous smoke and heat conditions are performed by a network wherein a photocell triggers a thyristor-controlled alarm in response to a particle-reflected illumination from a timing-circuit flasher within a light-tight detector chamber which admits smoke particles wafted by rising air currents, the detector chamber being finned, baffled and surfaced to promote the intended responses to smoke, and a thermal detector being connected to trigger the thyristor when effects of ambient heat predominate.

3,710,366
SUPERVISING DEVICE FOR THE SUPERVISION OF A PULSE SERIES

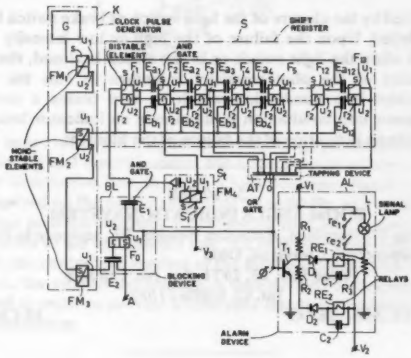
Leo Johannes Maria Welling, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,505

Claims priority, application Netherlands, March 7, 1970, 7003281

Int. Cl. G08b *21/00*

U.S. Cl. 340—248 P **2 Claims**



A supervising device for the supervision of a pulse series, comprising a shift register consisting of one or more stages, provided with an input terminal for receiving the pulse series to be supervised and a clock pulse generator connected to the shift register and having a higher pulse repetition frequency than the pulse series to be supervised, for the shifting of the pulses supplied to the input terminal through the shift register and tapping device connected on one side to the shift register and on the other side to an alarm device and which, in reaction to the shifting of the pulses to be supervised supplies to the alarm device a signal alternating between two voltages levels and having a higher repetition frequency than the pulse repetition frequency of the pulse series to be supervised, said alarm device being actuated when one of the voltage levels is present longer than a given period of time.

3,710,367
LAMP FAILURE INDICATOR FOR A DUAL-FILAMENT LAMP

Thomas G. Barnum, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

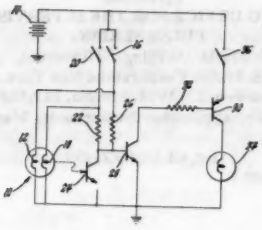
Filed Oct. 28, 1970, Ser. No. 84,807

Int. Cl. G08b *19/00*

U.S. Cl. 340—251 **3 Claims**

A lamp failure indicator for indicating the failure of a low intensity filament of a vehicle taillight, which is energized when the vehicle light switch is closed, and the failure of a high intensity filament of the vehicle taillight, which is energized when the vehicle brake switch is closed. A phototransistor is positioned relative to the vehicle taillight to monitor the light output therefrom. The impedance of the phototransistor is inversely proportional to the total light de-

tected. Resistors are inserted in series with the phototransistor upon the closure of the light switch or the brake switch to form a voltage divider. The resistors have impedances which are related to the impedance of the phototransistor when the low or high intensity filaments are energized so as to bias a first transistor, which receives an input from across the phototransistor, into nonconduction when the filaments



selected by the closure of the light switch or brake switch have not failed. Upon the failure of the high or low intensity filament when the light switch or brake switch is closed, the impedance of the phototransistor increases to bias the first transistor into conduction which in turn biases a second transistor into conduction to illuminate an indicator lamp to provide an indication of the failure of the filament.

3,710,368

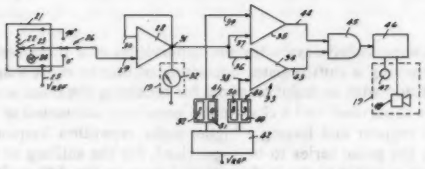
BOOM ANGLE INDICATION SYSTEM

Martin W. Hamilton, Arlington Heights, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 25, 1971, Ser. No. 118,658

Int. Cl. G08b *21/00*

U.S. Cl. 340—267 C **16 Claims**



A boom angle indication system includes a pendulum-type potentiometer for generating an electrical signal which is indicative of boom angle with respect to horizontal. The potentiometer is connected to a meter, calibrated in degrees, for reading by a crane operator. The system is further provided with means for establishing high and low boom angle limits and means for providing visual and/or audible alarms when the angle of inclination is outside of a permissible range.

3,710,369

OPENABLE ARCHITECTURAL FITTING WITH ALARM

Toshiro Takahashi, Shizuoka, Japan, assignor to Riken Right Metal Industries Co., Ltd., Shizuoka, Japan

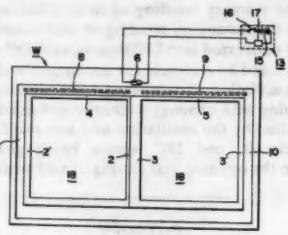
Continuation-in-part of Ser. No. 738,679, June 20, 1968, abandoned. This application Dec. 2, 1970, Ser. No. 94,472

Claims priority, application Japan, June 22, 1967, 42/53025; July 14, 1967, 42/44179; July 14, 1967, 42/60467; July 14, 1967, 42/60468; Aug. 4, 1967, 42/66780; Aug. 4, 1967, 42/66781; Aug. 31, 1967, 42/74265; Nov. 15, 1967, 42/95645

Int. Cl. G08b *13/08*

U.S. Cl. 340—274 **3 Claims**

An openable architectural structure or fitting, such as a window or door assembly, having a stationary framework of a non-magnetic material with an aperture and a movable member adapted to close the aperture at one position thereof and to open the same at another position thereof. An approach detecting means, such as a reed type switch means, a



limit switch means, an impedance bridge means, etc., is concealed within the stationary framework, so as to actuate a suitably mounted alarm means when the movable member is moved to the other position without authorization.

3,710,370

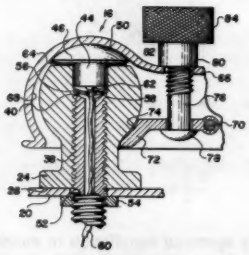
WARNING SYSTEM FOR AUTOMOBILE TRAILER HITCHES

Alfred P. Quilici, 60 Highland Avenue, Demarest, N.J., and Warren F. Wilson, 70 Dayton Road, Waterford, Conn.

Filed Nov. 3, 1971, Ser. No. 195,317

Int. Cl. G08b *21/00*

U.S. Cl. 340—27 S **10 Claims**



A warning system for signalling the improper coupling of a trailer hitch to an automobile includes a two-part coupler ball mounted on the rear of the automobile and comprising a fixed portion, an auxiliary portion movably mounted on the fixed portion, and spring means biasing said portions away from each other. Switch means are mounted within the coupler ball and are connected to a signal lamp and buzzer mounted on the automobile dashboard. The auxiliary ball portion is compressed upon the fixed ball portion when the trailer hitch is tightened upon the coupler ball, the ball portions maintaining the switch means in a position to deenergize the signal lamp and buzzer. When the trailer hitch is not properly tightened on the coupler ball, the switch means is actuated to energize the signal lamp and buzzer thereby providing a warning signal to the automobile driver.

3,710,371

PORTABLE SECURITY ALARM AND ALARM SYSTEM

George J. Whalen, 612 Woodland Hills, White Plains, N.Y., and Rudolf F. Graf, 111 Van Etten Boulevard, New Rochelle, N.Y.

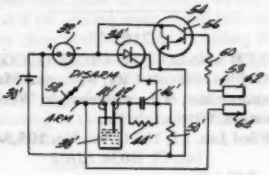
Filed Feb. 18, 1970, Ser. No. 12,344

Int. Cl. G08b *13/14*

U.S. Cl. 340—283 **4 Claims**

A portable alarm system including at least one alarm device triggered when displaced from a normal position. A mercury

switch triggers a latching type semi-conductor switch, causing electrical current to energize an alarm. Once sounded, the



alarm cannot be silenced unless the correct procedure or key method is followed.

3,710,372

ALARM SYSTEM FOR MONITORING A PLURALITY OF SERIALLY CONNECTED OBJECTS UTILIZING SIGNAL TRANSLATION TECHNIQUES

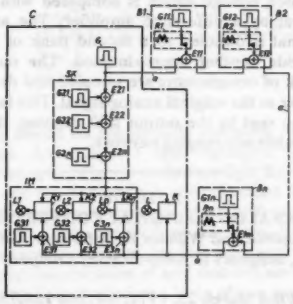
Tage Vilhelm Leander Andersson, Enskede; Lars Rune Isheden, Tyres; Bo Emil Johansson, Hagersten, and Stig Erik Warring, Skarholmen, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Dec. 9, 1970, Ser. No. 96,332

Claims priority, application Sweden, Jan. 8, 1970, 162

Int. Cl. G08b *13/22*

U.S. Cl. 340—276 **6 Claims**



An arrangement for causing an alarm in a guarding device, for example a burglary alarm device, includes a central guarding unit which sends out control signals through a loop to a number of objects to be guarded. The objects are connected in series with the guarding unit and upon unwarranted manipulation with the loop, for example upon attempts to by-pass an object, an alarm is obtained. Each object to be guarded comprises a signal translating means which translates the signal obtained through the loop in a manner characteristic of the respective object. The central guarding unit compares the control signal sent out from the guarding unit, with the signal sent back from the objects to be guarded. At least one of said two signals is translated before the comparison in order to obtain the same translation which has been obtained in the object to be guarded. During a comparison when an inequality between the two signals is sensed the alarm device is operated.

3,710,373

SIGNAL DISCRIMINATING SYSTEM

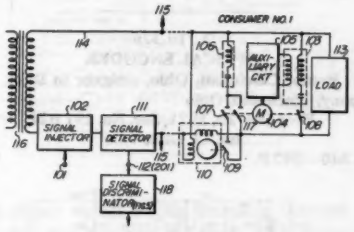
Seizi Watanabe, Yokohama; Kozo Ozaki, Tokyo; Hiroshi Oishi, Yokohama; Fumio Aoki, Yokohama; Fumio Aoki, Yokohama, and Shigeru Kawano, Tokyo, all of Japan, assignors to Matsushita Communication Industrial Co., Ltd., Yokohama, and The Tokyo Electric Power Co., Tokyo, both of Japan

Filed May 11, 1970, Ser. No. 36,368

Claims priority, application Japan, May 14, 1969, 44/38630; May 14, 1969, 44/38633

Int. Cl. G08c *15/10*

U.S. Cl. 340—310 **5 Claims**



An improvement in a signal discriminating system used in a monitoring and control system for a low voltage commercial power distribution line, in which a high frequency signal is superimposed on the power current of 50 or 60 Hz, as a communication medium between a monitoring spot and consumers connected to the distribution line; the improvement resides in that in the centralized reading of the meters of respective consumers, the monitoring channel is time-divided or frequency-divided in order to provide a reference signal level peculiar to each consumer.

3,710,374

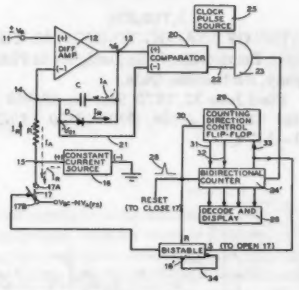
DUAL-SLOPE AND ANALOG-TO-DIGITAL CONVERTER WHEREIN TWO ANALOG INPUT SIGNALS ARE SELECTIVELY INTEGRATED WITH RESPECT TO TIME

Austin T. Kelly, Morristown, N.J., assignor to Wester Instruments, Inc., Newark, N.J.

Continuation-in-part of Ser. No. 19,605, March 16, 1970, abandoned. This application Aug. 17, 1970, Ser. No. 64,275

Int. Cl. H03k *13/20*

U.S. Cl. 340—347 NT **13 Claims**



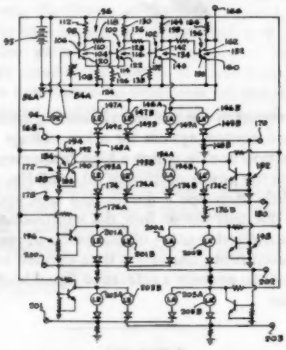
An electrical integrating circuit arrangement is disclosed which is especially suitable for use in combination with timing means in dual-slope analog-to-digital converters because it operates with time controlled closure of a single, low-impedance switching device of the single-pole, single-throw type to effect selective time integrations of two D.C. input signals;

an analog signal and an oppositely directed reference current. The integrating arrangement comprises an operational amplifier having inverting and non-inverting inputs and feedback to the inverting input through a capacitor. The analog signal source may be permanently connected to the non-inverting input whereas the second input signal is similarly connected to the inverting input through a resistance. The switching device is closed to connect the second input signal end of the resistance to a source of potential. Timed closure of the switching device by the timing means causes the integrating arrangement to generate two successive voltage ramps having slopes which are respective functions of the two signals exclusive of one another. The instant combination may be utilized to advantage in the digitalization of bipolar analog signals.

3,710,375
OPTICAL ENCODER

John W. Brean, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed Oct. 20, 1971, Ser. No. 191,024
Int. Cl. G08c *9/06*
U.S. Cl. 340—347 P **9 Claims**

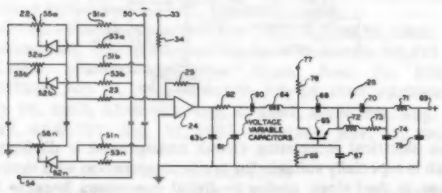


An optical encoder is disclosed utilizing a V-scan method of read-out which provides the output for each track of a code disc and the complementary output of that track. Each track, except the least significant track of the code disc, is provided with two pair of photocells, one to produce the leading and complementary leading output and the other to produce the lagging and complementary lagging output. A novel electrical circuit is utilized by the encoder to reduce the number of components required in obtaining a parallel output and parallel complementary output, the complementary output being obtained at the code disc.

3,710,376
CALIBRATION OF ANALOG-TO-DIGITAL CONVERTER

Dale A. Fluegel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 22, 1970, Ser. No. 48,344
Int. Cl. G06f *15/34*; **H03k** *13/20, 13/02*
U.S. Cl. 340—347 CC **3 Claims**

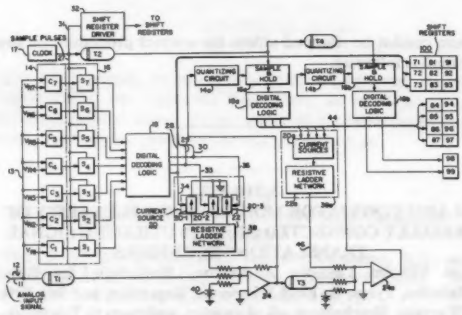


Analog signals are applied sequentially through a multiplexer and an analog-to-digital converter to a digital computer. The computer is programmed to check the zero point and the span of the converter periodically. Zero and reference voltages are applied to the multiplexer when these respective checks are made. Output signals from the computer are applied as feedback error signals to adjust the converter.

3,710,377
HIGH SPEED ANALOG-TO-DIGITAL CONVERTER

Francisco J. Guillen, Ellicott City, Md., and Matthew J. Campanella, Hammonton, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 11, 1971, Ser. No. 105,549
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD **7 Claims**

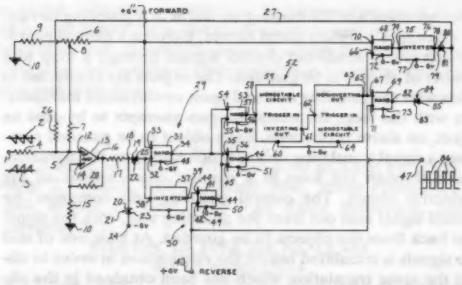


An analog signal is directed to a plurality of comparators. Each of the comparators has a different threshold level of conduction. Each threshold level is determined by a different reference voltage being applied to each of the comparators. The outputs of the comparators are sampled at a predetermined rate by a plurality of flip-flops whose outputs are held constant while they are decoded into usable form and directed to a shift register. The decoded outputs are also reconverted into an analog voltage which is compared with the original analog signal by a difference amplifier. The amplified difference signal is directed to a second bank of comparators which provide another approximation. The outputs of the second bank of comparators are sampled and decoded in the same manner as the original analog signal. This latter decoded signal is also sent to the output shift register. It is also sent through another sub-ranging network.

3,710,378
ANALOG TO DIGITAL CONVERTER

Joseph D. Radtke, and William W. Kiffmeyer, both of Milwaukee, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed March 22, 1971, Ser. No. 126,730
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD **9 Claims**



An analog error signal is received from a machine tool position sensor. Its magnitude is sensed by a comparator circuit in-

cluding an operational amplifier and a digital output level is generated when a particular analog voltage level is sensed. The digital output level resets the position sensor to restore the analog output signal and the comparator circuit to their initial state. A reset circuit, including two monostable circuits, generate a delayed reset pulse to the input of the comparator to reset its output if the analog input signal fails to do so. Forward and reverse directional circuits including NAND logic gates are connected together in parallel to the comparator output and conditioned by forward and reverse reference signals to convey the digital output from the comparator when the machine is moving in the direction to which the comparator has been preconditioned.

3,710,379
SWITCHING APPARATUS FOR SELECTIVELY AND SEQUENTIALLY OPERATING TWO ROWS OF LAMPS WITH LOCK-OUT MEANS THEREBETWEEN

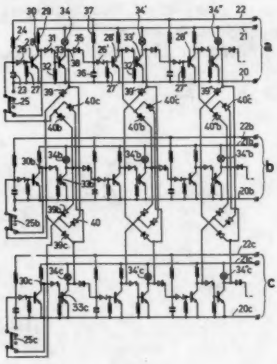
Anne Hendrik Bruinsma, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 5, 1970, Ser. No. 77,800

Claims priority, application Netherlands, Oct. 5, 1970, 6915254

Int. Cl. G08b *5/36*

U.S. Cl. 340—379 **13 Claims**



A switching device for sequentially operating two or more rows of lamps. An elongated light conductor is arranged between the two rows of lamps so that the light from a lamp of the first row and the light from a corresponding lamp of the second row emanate from the same given surface area of the light conductor. Cross connections are provided between switching elements connected in first and second circuits providing sequential operation of said first and second rows of lamps, respectively, so that when a lamp of one row is ignited, the corresponding lamp of the other row cannot be ignited simultaneously.

3,710,380
SYSTEM FOR RECORDING AND REPRODUCING RADAR VIDEO SIGNALS

Antonius Fredericus Mattias Bouman, Hengelo; Antoon Hendrikus Brands, Borne, and Willem Mulder, Hengelo, all of Netherlands, assignors to N.V. Hollandse Signoalapparaten, Hengelo (O), Netherlands

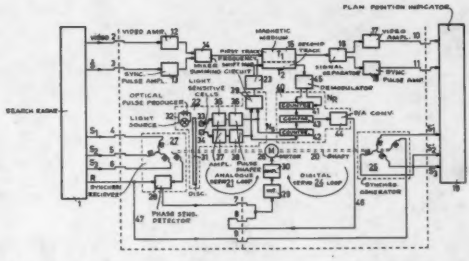
Filed May 5, 1970, Ser. No. 34,818

Claims priority, application Netherlands, May 19, 1969, 6907588

Int. Cl. G01s *7/12*

U.S. Cl. 343—5 R **6 Claims**

A system for recording and reproducing radar video signals supplied by a pulse radar wherein the video signals and transmitter synchronizing pulses are recorded on a first track of a magnetic medium and information characteristic of the angular positions of the antenna of the pulse radar are recorded on a second track of the same magnetic medium. The system comprises a shaft rotating substantially in synchronism with the antenna, an analogue servo-loop system coupled to the shaft and closed during recording intervals to control the shaft so that the angular positions of the shaft accurately corresponds with the positions of the antenna. The system further comprises means for translating the angular positions of the



shaft into digital signals during recording intervals and a frequency shift modulator for converting these digital signals into a frequency keyed signal that is recorded on the second track of the magnetic medium. During reproducing intervals the system comprises a digital servo-loop system for controlling the shaft so that the angular positions of the shaft corresponds accurately with the angular positions derived from the magnetic medium. The system further comprises means for deriving from the shaft, analogue signals characteristic of the angular position of the shaft.

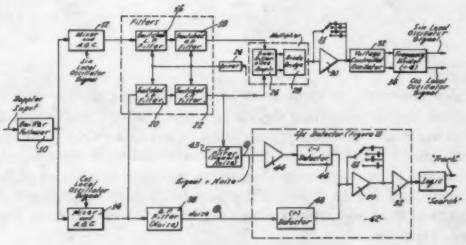
3,710,381
SIGNAL-TO-NOISE DETECTOR FOR NON-STABILIZED DOPPLER RADAR

Stanley King, Larchmont, and Peter R. Tierney, Briarcliff Manor, both of N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Aug. 30, 1971, Ser. No. 175,883

Int. Cl. G01s *9/44*

U.S. Cl. 343—8 **4 Claims**



An improved signal-to-noise detector is provided for inclusion in the frequency trackers used in Doppler aircraft radar systems. The signal-to-noise detector of the invention samples noise over the entire pass band of the frequency tracker input except for a range of frequencies above and below the tracking frequency of the local oscillator. In this way, should the system attempt to lock onto a side lobe or image return, rather than the true Doppler return, the Doppler return would cause the noise level to rise, so that the system could not lock onto the spurious return, and in this way erroneous tracking is prevented.

3,710,382

SECONDARY RADAR

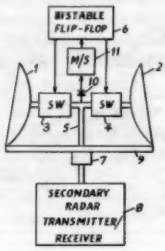
Alaric Allen, Stortford, England, assignor to A. C. Cossor Limited, Harlow, Essex, England

Filed Aug. 26, 1971, Ser. No. 175,062

Claims priority, application Great Britain, April 14, 1971, 9,402/71

Int. Cl. G01s 9/02; H01q 21/06

U.S. Cl. 343—6.5 R 5 Claims



To increase the data rate of a mechanically scanning radar aerial, two aerials on a common support share a common rotating joint to which they are alternately switched under remote control, preferably in response to burst of RF power transmitted from the aerial.

3,710,383

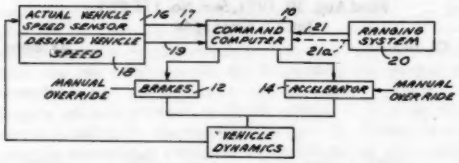
AUTOMATIC HEADWAY CONTROL SYSTEM

James R. Cherry, Barrington, Ill., Joseph W. Crow, Taylor, Mich., and Robert H. Parker, Farmington, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 2, 1970, Ser. No. 69,023

Int. Cl. G01s 9/04, 9/50

U.S. Cl. 343—7 ED 12 Claims



An electronic system coupled to a ranging device and a vehicle speed measuring device automatically controls vehicle braking and acceleration according to available vehicle headway and vehicle speed. The system provides acceleration, coasting, or braking according to the position and speed of its vehicle relative to a preceding vehicle. Significant improvements in roadway capacity and vehicle safety result from the use of the system.

3,710,384

SIGNAL-CORRELATING APPARATUS FOR IMPROVING THE ANGULAR RESOLUTION OF A DIRECTIONALLY RANGING SYSTEM

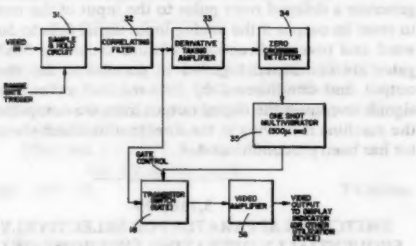
William D. Ashcraft, Fullerton, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed Nov. 17, 1969, Ser. No. 877,311

Int. Cl. G01s 9/02

U.S. Cl. 343—7 A 15 Claims

Means for improving the azimuth resolution of an azimuthally scanning ground-mapping radar. The sampled-and-held video for a given range bin is processed by a correlation filter having a preselected impulse response and then differentiated. A negative-going zero level of the differentiated



signal is employed as indicative of the scan time or angular position of the centroid of a sensed target to within less than the angular beamwidth of the antenna.

3,710,385

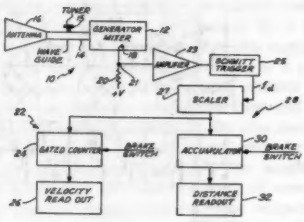
VEHICLE INITIAL SPEED AND STOPPING DISTANCE INDICATOR

Donald W. Howard; Dewey W. Eppley, and Hugh D. Steininger, all of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Sept. 29, 1970, Ser. No. 76,408

Int. Cl. G01s 9/46

U.S. Cl. 343—9 4 Claims



A system utilizing Doppler radar for indication of vehicle speed at the time of a brake application and the stopping distance for that particular brake application. The output from the Doppler radar is a frequency that is directly related to the velocity of the vehicle with respect to ground. By the proper selection of the other constants, a given number of Hertz can correspond to a given velocity. Counting all the cycles from initial brake application until stopped and dividing by the appropriate value will give the total stopping distance. Dual counters that alternately record a velocity signal are applied. Light emitting diodes provide a visual readout of velocity and stopping distance.

3,710,386

TIME-SHARED FREQUENCY TRACKING LOOP

Ernest F. Darboven, Katonah, and Leon R. Solomon, Ossining, both of N.Y., assignors to The Singer Company, New York, N.Y.

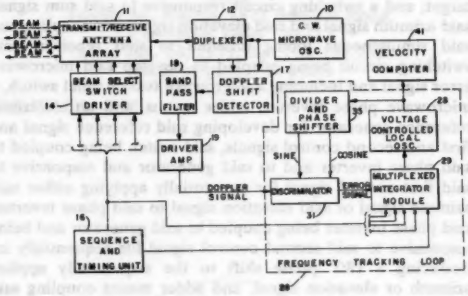
Filed July 6, 1971, Ser. No. 159,861

Int. Cl. G01s 9/46

U.S. Cl. 343—9 3 Claims

In a frequency tracking loop, a single voltage-controlled local oscillator produces a sequence of output signals representing the respective peak power frequencies in a recycling sequence of input signals. The oscillator output is compared to the input signals to produce a DC error signal passed to a single operational amplifier. Integrating capacitors

are alternately coupled between the amplifier's input and output in a synchronized sequence corresponding to the input signals. The amplifier output, which controls the oscillator



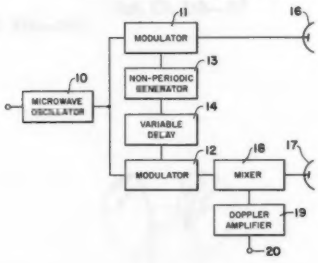
frequency, is thus repeatedly switched from one value to the next representing the last corresponding voltage in the previous cycle.

3,710,387

F.M. RADAR RANGE SYSTEM

Walter R. Hinchman, Riverside; Donald J. Adrian, Corona, and Andrew W. Walters, Riverside, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 6, 1960, Ser. No. 54,326
Int. Cl. G01s *9/04*, *9/24*
U.S. Cl. 343—12 R **3 Claims**



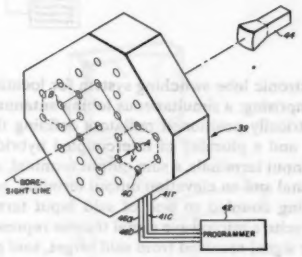
1. In a random modulated radar system utilizing carrier correlation the combination comprising a source of unmodulated radio frequency signal, a first modulator coupled to said signal source having an input and an output, a second modulator coupled to said signal source having an input and an output, noise generator means for generating a non-periodic signal directly coupled to the input of said first modulator for frequency modulating the signal coupled thereto with said non-periodic signal, antenna means coupled to the output of said first modulator for transmitting the non-periodic frequency modulated signal to a target, variable delay means coupling said noise generator to the input of said second modulator for frequency modulating the signal coupled thereto with a delayed non-periodic signal, mixer means having two inputs and an output, the output of said second modulator being coupled to one of the inputs of said mixer, antenna means for receiving a signal from said target being coupled to the other input of said mixer and doppler amplifier means coupled to the output of said mixer for producing a maximum output signal when there is unity correlation between the two inputs to said mixer.

3,710,388

RADAR SCANNING METHOD AND APPARATUS

Donald S. Banks, Wellesley, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 6, 1970, Ser. No. 61,553
Int. Cl. G01s *9/02*
U.S. Cl. 343—16 R **10 Claims**



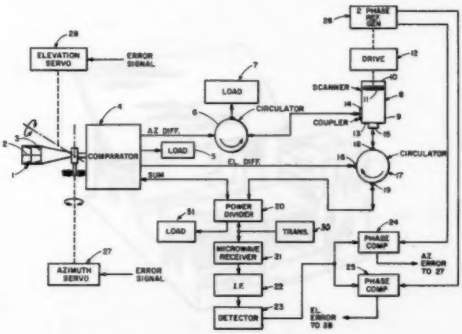
Apparatus and method for measuring the angular deviation of targets from the boresight line of a radar antenna wherein the phase center of such antenna is moved about the boresight to impress a Doppler shift signal on the signals from all targets within the beam of such antenna, the characteristics of such shift signal being indicative of the angular deviation of each one of the targets from the boresight line.

3,710,389

MICROWAVE BEAM SCANNER CIRCUIT

Vernon L. Heeren, Wayland, Mass., assignor to the United States of America as represented by the Secretary of the Navy

Filed Oct. 22, 1970, Ser. No. 82,890
Int. Cl. G01s *9/22*
U.S. Cl. 343—7.4 **6 Claims**



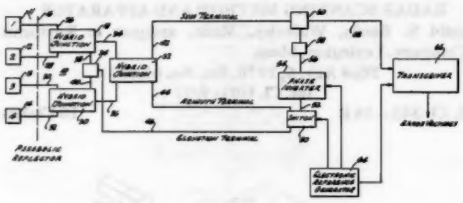
A "Cosro" antenna arrangement is disclosed in which the scanning rate of the receiving beam may be changed in a relatively small time interval by a scanner which utilizes a rotating vane positioned within a circular wave guide section closed off by a shorting plate. The system utilizes a single receiver, and the transmit beam has a reduced amount of residual scan.

3,710,390

MONOPULSE SWITCHING SYSTEM

Donald E. Kreinheder, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 1, 1957, Ser. No. 658,915
Int. Cl. G01s 9/22
U.S. Cl. 343—16 M 8 Claims



6. An electronic lobe switching system for locating a target in space comprising: a simultaneous lobing antenna including four symmetrically positioned radiators defining the corners of a square, and a plurality of intercoupled hybrid junctions having four input terminals, a sum output terminal, an azimuth output terminal and an elevation output terminal, each of said radiators being coupled to one of said input terminals and adapted to excite a microwave signal therein representative of a microwave signal received from said target, said plurality of hybrid junctions being adapted to develop a sum signal in said sum terminal, an azimuth signal in said azimuth terminal and an elevation signal in said elevation terminal representative of the range, the azimuth and the elevation of said target respectively; a receiver responsive to a microwave error signal and a reference signal and adapted to develop demodulated error voltages representative of the azimuth and elevation of said target; and a switching circuit responsive to said sum signal, said azimuth signal and said elevation signal and coupling and said simultaneous lobing antenna to said receiver, said switching circuit being adapted to develop said microwave error signal and including a microwave two-channel switch, a microwave phase inverter, adder means, and an electronic reference generator for developing said reference signal and first and second control signals, said switch being coupled to said phase inverter and to said generator and responsive to said first control signal for sequentially applying either said azimuth signal or said elevation signal to said phase inverter, said phase inverter being coupled to said generator and being responsive to said second control signal for sequentially introducing a 180° phase shift to the sequentially applied azimuth or elevation signal, and adder means coupling said phase inverter to said sum terminal and being adapted to mix the sequentially phase-inverted signal from said phase inverter and said sum signal to develop said microwave error signal.

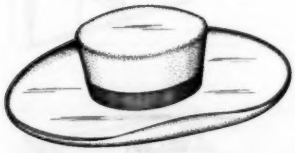
ERRATA

For Class 444—1 see:
Patents Nos. 3,710,344 thru 3,710,347

DESIGNS

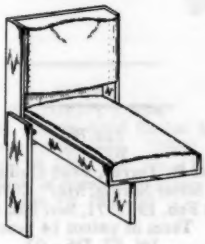
JANUARY 9, 1973

225,793
HAT
Joseph M. Aquila, 1671 Burgess Road, Cleveland, Ohio 44112
Filed Jan. 20, 1971, Ser. No. 108,252
Term of patent 14 years
Int. Cl. D2—*05*
U.S. Cl. D2—258

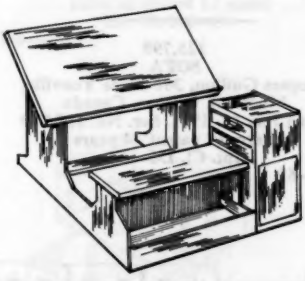


225,794
NECKTIE
Charles C. Savage, 702 Redick Blvd., Carter Lake, Iowa 68110
Filed Sept. 10, 1970, Ser. No. 24,913
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—351

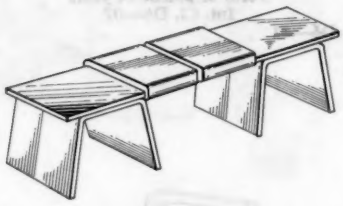
225,795
FOLDING CHAIR
Giancarlo De Carlo, Milan, Italy, assignor to J. G. Furniture Company, Inc., Quakertown, Pa.
Filed Feb. 1, 1971, Ser. No. 111,798
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—41



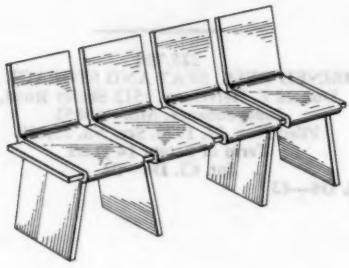
225,796
COMBINED DESK, SEAT AND STORAGE UNIT
Donald E. Helverson, 1512 Sheley Road, Independence, Mo. 64052
Filed Nov. 27, 1970, Ser. No. 26,189
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—43



225,797
BENCH
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,205
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—58

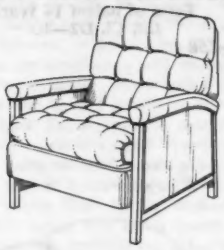


225,798
BENCH
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,211
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—59



225,799
SOFA
Jacques Guillon, 306 Place Youville, Montreal, Quebec, Canada
Filed Jan. 25, 1971, Ser. No. 109,729
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—63

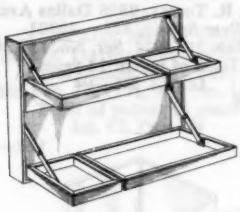
225,800
CHAIR
Morris F. Fisher, Carmel, Ind., assignor to Mohasco Industries, Inc., Amsterdam, N.Y.
Filed Jan. 6, 1971, Ser. No. 104,538
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—71



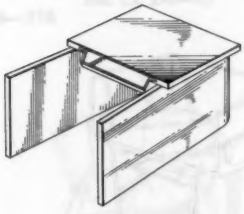
225,801
CHAIR
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,178
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—75

225,802
SHOE RACK
Louis Hoffman, Suffern, N.Y., assignor to Hold-All Manufacturing Co., Inc., Suffern, N.Y.
Filed Nov. 16, 1970, Ser. No. 26,006
Term of patent 3½ years
Int. Cl. D6—*99*
U.S. Cl. D6—116

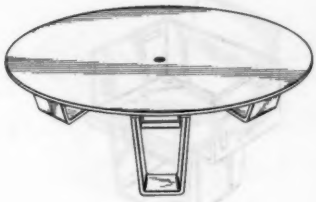
225,803
FOLDABLE WALL SHELVING UNIT
James S. Moore, 1601 Rambla Pacifico, Malibu, Calif. 90265
Filed June 29, 1970, Ser. No. 23,746
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—130



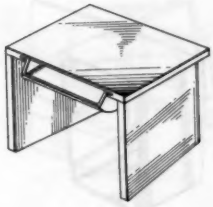
225,804
STUDENT DESK
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,181
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—138



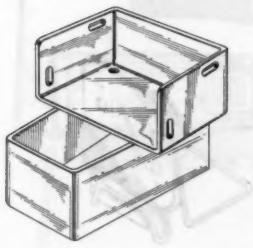
225,805
WORK TABLE FOR STUDENTS
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,193
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—146



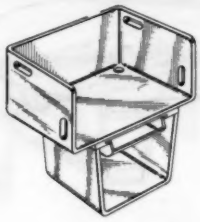
225,806
STUDENT DESK
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,202
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—179



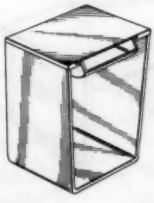
225,807
STUDENT'S CARREL UNIT
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,189
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—181



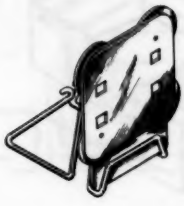
225,808
STUDENT CARREL UNIT
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,209
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—181



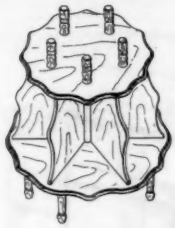
225,809
STUDENT DESK
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,194
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—181



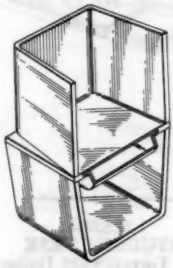
225,810
COMBINED TELEVISION GUIDE HOLDER AND PROGRAM REMINDER
Richard P. Bohan, 88 Edgewater Place, Edgewater, N.J. 07020
Filed Dec. 28, 1970, Ser. No. 26,661
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—184



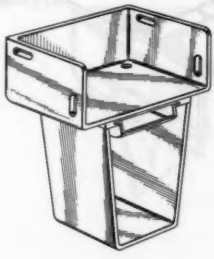
225,811
ROTATABLE RACK FOR PHONOGRAPH RECORDS
Andy Wooten, 2219 La Monte, Houston, Tex. 77018
Filed Oct. 15, 1970, Ser. No. 25,517
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—185



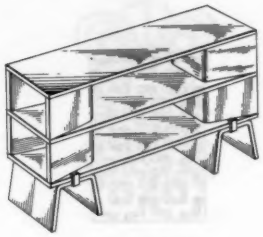
225,812
STUDY CARREL
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,201
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—189



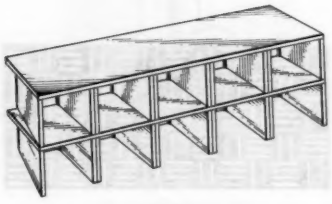
225,813
STUDY CARREL
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,196
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—189



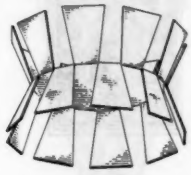
225,814
STORAGE SHELF UNIT
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,175
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—189



225,815
STORAGE SHELF UNIT
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,176
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—189

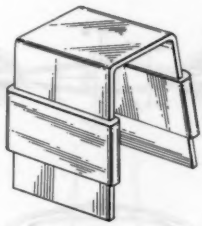


225,816
PEDESTAL FOR FURNITURE
Thomas Fedor, 184 Lottridge St., Hamilton, Ontario, Canada
Filed Mar. 1, 1971, Ser. No. 120,002
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—196

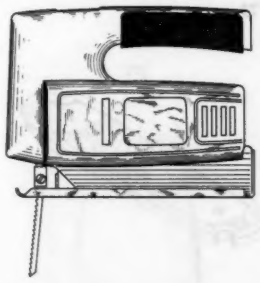


225,817
BACKREST SUPPORT
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,204
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—200

225,818
DOUBLE BACKREST UNIT
Frank R. Torrey, 9805 Dallas Ave., Silver Spring, Md. 20901
Filed Feb. 19, 1971, Ser. No. 117,177
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—200

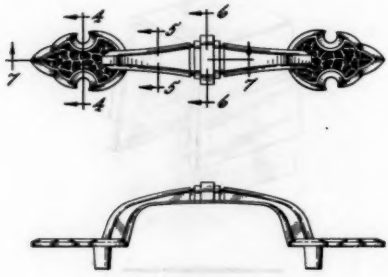


225,819
SABER SAW
Melvin H. Boldt, Glenview, Ill., assignor to G. W. Murphy Industries, Inc., Houston, Tex.
Filed Jan. 20, 1971, Ser. No. 108,256
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—64

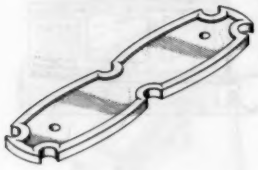


225,820
PULL
Raymond U. H. Tegner, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 7, 1970, Ser. No. 26,332
Term of patent 14 years
Int. Cl. D8—06
U.S. Cl. D8—158

225,821
PULL
La Verne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed July 9, 1971, Ser. No. 161,433
Term of patent 14 years
Int. Cl. D8—06
U.S. Cl. D8—166

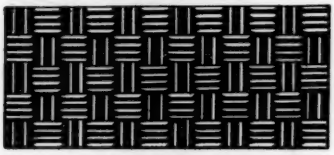


225,822
ORNAMENTAL BACKING PLATE FOR HANDLE AS USED ON DOORS, DRAWERS, AND THE LIKE
David F. James, Redondo Beach, Calif., assignor to Hyer Hardware Mfg. Co., Anaheim, Calif.
Filed Sept. 10, 1971, Ser. No. 179,607
Term of patent 14 years
Int. Cl. D8—09
U.S. Cl. D8—179



225,823
HINGE
Lee Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.
Filed Dec. 3, 1971, Ser. No. 204,798
Term of patent 14 years
Int. Cl. D8—06
U.S. Cl. D8—189

225,824
HINGE
Lee Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.
Filed Dec. 3, 1971, Ser. No. 204,799
Term of patent 14 years
Int. Cl. D8—06
U.S. Cl. D8—189



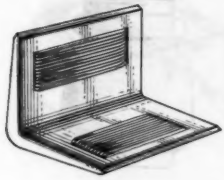
225,825
HINGE
Lee Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.
Filed Dec. 3, 1971, Ser. No. 204,800
Term of patent 14 years
Int. Cl. D8—06
U.S. Cl. D8—189

225,826
HINGE
Lee Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.
Filed Jan. 3, 1972, Ser. No. 215,254
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—191

225,827
HINGE
Lee Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.
Filed Dec. 3, 1971, Ser. No. 204,801
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—191

225,828
HINGE
Lee Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.
Filed Dec. 3, 1971, Ser. No. 204,797
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—191

225,829
CORNER PROTECTOR FOR BINDING STRAPS SURROUNDING BUNDLES OF SHEETS AND THE LIKE
Bela G. Szabo, Pittsburgh, Pa., assignor to Bruce Plastics, Inc., Pittsburgh, Pa.
Filed May 14, 1971, Ser. No. 143,744
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—263



225,830
DISPENSING CONTAINER
Robert L. Hill, Franklin Park, Ill., assignor to The Gillette Company, Boston, Mass.
Filed July 21, 1971, Ser. No. 164,985
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—3

225,831
BOTTLE
Thomas E. Brotton, 9581 Beachside Drive, Huntington Beach, Calif. 92646
Filed Nov. 1, 1971, Ser. No. 194,790
Term of patent 7 years
Int. Cl. D9—*01*
U.S. Cl. D9—40

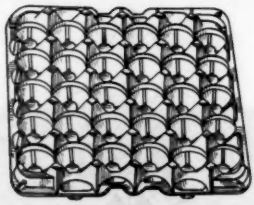
225,832
JAR OR SIMILAR ARTICLE
Willard R. Horne, Northvale, N.J., and Robert P. Vuillemenot, Dennis, Mass., assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed July 12, 1971, Ser. No. 161,400
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—100

225,833
BOTTLE
Norman L. Auslander, Pomona, N.Y., assignor to Lander Co., Inc., New York, N.Y.
Filed Apr. 21, 1971, Ser. No. 136,279
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—115

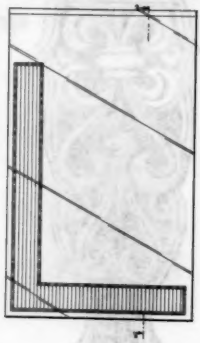
225,834
BOTTLE
Stephen J. Kneapler, Miami, Fla., assignor to Richford America Corporation, Farmingdale, N.Y.
Filed Oct. 18, 1971, Ser. No. 190,438
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—143

225,835
CONTAINER FOR FLOWABLE MATERIALS OR THE LIKE
Robert T. Johnson and Gaylor W. Brown, Beaverton, Mich., assignors to Koehring Company
Filed Sept. 21, 1970, Ser. No. 25,092
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—169

225,836
PACKAGING TRAY FOR EGGS OR OTHER FRAGILE ARTICLES
James W. Boyd, Crown Point, Ind., and Clifford H. Bessett, South Holland, Ill., assignors to Packaging Corporation of America, Evanston, Ill.
Filed Jan. 14, 1971, Ser. No. 106,634
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—190



225,837
FOOD WRAPPER BAG
Roger Dale Yates, 1431 Pepperidge Road, Asheboro, N.C. 27203
Filed Mar. 2, 1971, Ser. No. 120,386
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—250

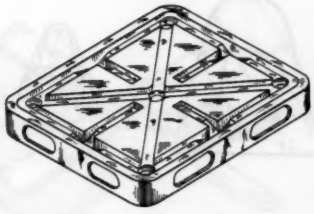


225,838
COMBINED CUP AND POURING HOSE ATTACHMENT FOR A CAN OR THE LIKE
Frank S. Flider, Chicago, Ill., assignor to The Justrite Manufacturing Company, Chicago, Ill.
Filed Dec. 14, 1970, Ser. No. 26,491
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—290

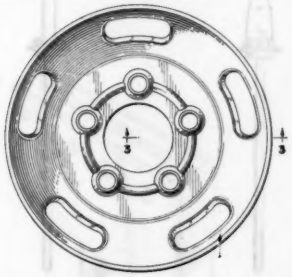
225,839
FLORAL DISPLAY CART
Ralph W. Bachman and Dallas R. Humphrey, Minneapolis, Minn., assignors to Bachman's Inc., Minneapolis, Minn.
Filed Apr. 21, 1971, Ser. No. 136,288
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D14—3

225,840
FILE CART
Douglas C. Ball, Senneville, Quebec, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Ontario, Canada
Filed Oct. 7, 1970, Ser. No. 25,373
Term of patent 14 years
Int. Cl. D6—*99;* D12—*02*
U.S. Cl. D14—3

225,841
PALLET
Lawrence Skendrovic, West Mifflin, Pa., assignor to Pallet Development, Inc., Ambridge, Pa.
Filed Dec. 14, 1971, Ser. No. 208,051
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D14—3



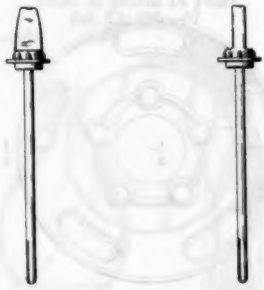
225,842
RIBBED WHEEL CENTER
Richard H. Clement, 10900 Jann Court, La Grange, Ill. 60525
Filed Jan. 12, 1972, Ser. No. 217,430
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—30



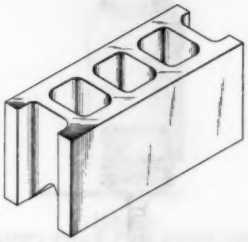
225,843
CHAIR BODY
Randall P. Buhk, Wyoming, Mich., assignor to Steelcase, Inc., Grand Rapids, Mich.
Filed Apr. 20, 1970, Ser. No. 22,513
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—1

225,844
TRANSLUCENT NUGGET OF SOLIDIFIED INORGANIC CHEMICALS
Frank J. Lazet, Philadelphia, Pa., assignor to Philadelphia Quartz Company, Philadelphia, Pa.
Filed May 26, 1971, Ser. No. 147,286
Term of patent 14 years
Int. Cl. D24—*02;* D1—*99*
U.S. Cl. D16—1

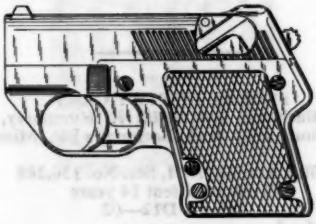
225,845
DISPENSER FOR SMALL QUANTITIES OF LIQUID
Allan Costa, 662 Udall Road, West Islip, N.Y. 11795
Filed Nov. 17, 1971, Ser. No. 199,826
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D16—2



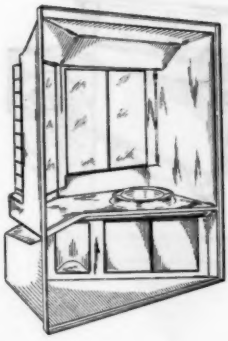
225,846
BLOCK
Harry F. Cruzen, Jr., Alpena, Mich., assignor to Besser Company, Alpena, Mich.
Continuation of design application Ser. No. 13,725, Sept. 26, 1968. This application Mar. 23, 1970, Ser. No. 22,002
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2



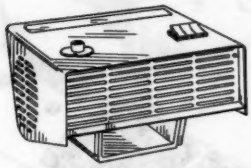
225,847
PISTOL
Philip R. Lichtman, 35 Lee St., Cambridge, Mass. 02139
Filed Feb. 23, 1971, Ser. No. 118,210
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—1



225,848
BATHROOM UNIT
James F. Fulton, Mamaroneck, N.Y., and Joseph A. Rinaldi, Fort Lee, N.J., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Jan. 14, 1971, Ser. No. 106,619
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



225,849
FAN HEATER
Petrus Joannes Stut, Eelde, Netherlands, assignor to United States Philips Corporation
Filed Sept. 23, 1970, Ser. No. 25,152
Claims priority, application Switzerland Mar. 23, 1970
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—73

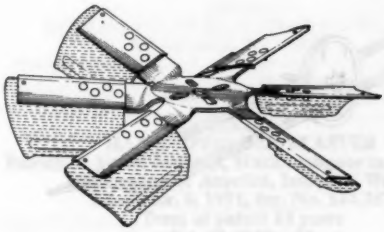


225,850
BATH STOVE
Matti Johannes Suuronen, Puistotie 43, Westend, Finland
Filed May 11, 1971, Ser. No. 142,423
Claims priority, application Germany Nov. 12, 1970
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—84

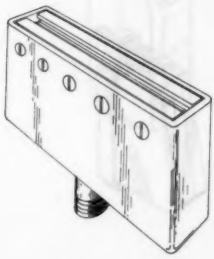
225,851
RADIANT HEATER
Edwin J. Cowan, 275 Manzanita, Sierra Madre, Calif. 91024
Filed Mar. 5, 1971, Ser. No. 121,611
Term of patent 7 years
Int. Cl. D23—*03*
U.S. Cl. D23—122

225,852
CANISTER FOR DEHUMIDIFYING CRYSTALS OR A SIMILAR ARTICLE
Leonard R. Gaylord, Gates, N.Y., assignor to International Valide Corp., Rochester, N.Y.
Filed Dec. 16, 1970, Ser. No. 26,527
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—146

225,853
FAN
Jay R. Hecht, 17847 Cathedral Place, Encino, Calif.
Filed Nov. 5, 1971, Ser. No. 196,257
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—165

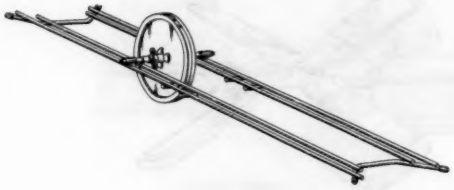


225,854
INDUSTRIAL BURNER
David T. Gray, Warminster, and Charles W. Morck, Jr., Philadelphia, Pa., assignors to Selas Corporation, Dresher, Pa.
Filed Oct. 6, 1970, Ser. No. 25,353
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—129

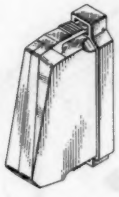


225,855
DENTAL CUSPIDOR
John Daniel Krantz, Camarillo, Calif., assignor to Coastal Dynamics Corporation, Venice, Calif.
Filed Oct. 7, 1971, Ser. No. 187,586
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1

225,856
ROTATIONAL ENERGY DEMONSTRATOR
David E. Munn, Framingham, Thomas M. Mello, West Roxbury, and Robert Maddestra, Hyde Park, Mass., assignors to Damon Corporation, Needham, Mass.
Filed Mar. 29, 1971, Ser. No. 129,315
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1

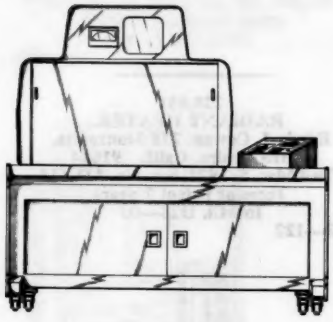


225,857
ELECTRICAL CONNECTOR HOUSING
Friedrich Josef Alois Kourimsky, Leutershausen, Germany, assignor to AMP Incorporated, Harrisburg, Pa.
Filed Oct. 20, 1970, Ser. No. 25,575
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1

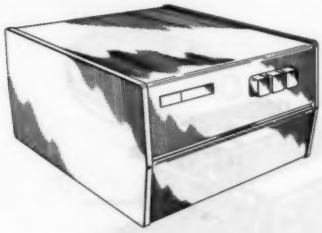


225,858
KEYBOARD FOR A BANK TELLER TERMINAL OR THE LIKE
George H. Kline, Bethany, Okla., assignor to Honeywell Information Systems Inc., Oklahoma City, Okla.
Filed Jan. 4, 1971, Ser. No. 103,954
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

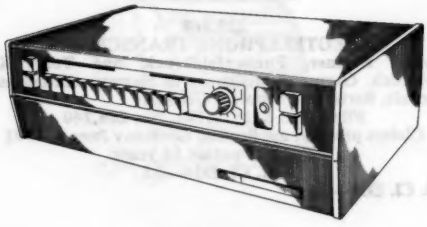
225,859
ELECTRONIC COMPUTER OR SIMILAR ARTICLE
Nicholas A. Siecko, Malvern, and George W. Murphy, Wayne, Pa., assignors to Educational Computer Corporation, Radnor, Pa.
Filed Dec. 1, 1971, Ser. No. 203,931
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



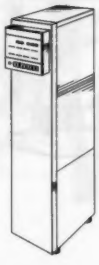
225,860
HOUSING FOR ELECTRONIC APPARATUS OR SIMILAR ARTICLE
Robert E. Kalvitis, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 14, 1970, Ser. No. 26,438
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



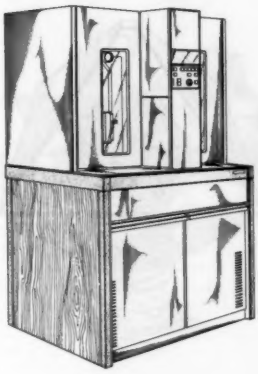
225,861
HOUSING FOR ELECTRONIC APPARATUS OR SIMILAR ARTICLE
Robert E. Kalvitis, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 14, 1970, Ser. No. 26,439
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



225,862
ELECTRONIC COMPUTER OR SIMILAR ARTICLE
Hideki Ishii, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Feb. 9, 1971, Ser. No. 114,094
Claims priority, application Japan Aug. 13, 1970
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

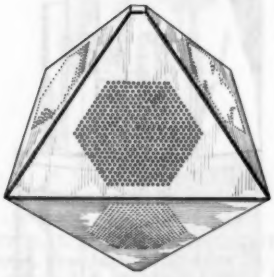


225,863
MAGNETIC TAPE VIDEO CASSETTE MACHINE
Darrell S. Staley, San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Mar. 19, 1971, Ser. No. 126,389
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

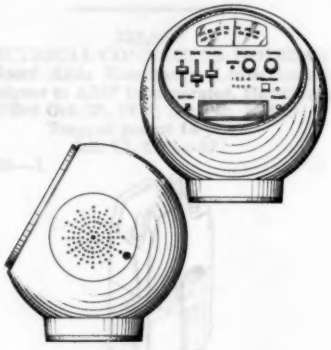


225,864
HAND OPERABLE BLASTER
Patrick A. Yates, Issaquah, Wash., assignor to Explosives Corporation of America, Issaquah, Wash.
Filed Mar. 8, 1971, Ser. No. 122,267
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

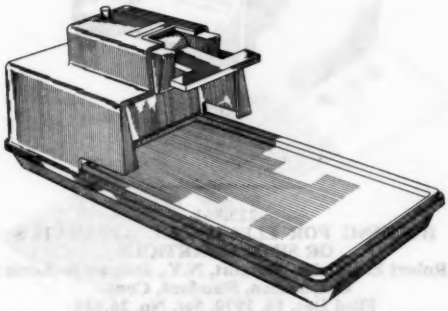
225,865
LOUDSPEAKER
Bo Arne Sjostedt, Trelleborg, and Stig Allan Valdemar Olsson, Vintrie, Sweden, assignors to Semiproduktion AB, Malmo, Sweden
Filed Feb. 22, 1971, Ser. No. 117,868
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



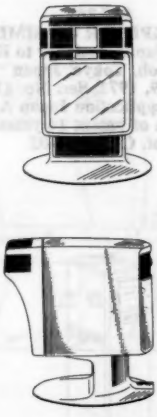
225,866
COMBINED TAPE PLAYER AND RADIO RECEIVER THEREFOR
Ryuzo Fujita, Suidobashi Bldg. 4–4, 1-chome, Hongo, Bunkyo-ku, Tokyo, Japan
Filed Feb. 3, 1971, Ser. No. 112,506
Claims priority, application Japan Aug. 3, 1970
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



225,867
UNATTENDED TELEPHONE ANSWERING APPARATUS OR SIMILAR ARTICLE
Robert H. Van Valkinburgh, Mendon, and Robert A. Clowe, Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Oct. 29, 1971, Ser. No. 194,091
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

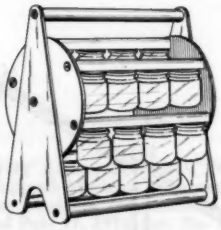


225,868
VIDEOTELEPHONE TRANSCEIVER
Herbert Kramer, Furstenfeldbruck, and Tonis Kao, Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Dec. 8, 1971, Ser. No. 206,240
Claims priority, application Germany June 8, 1971
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



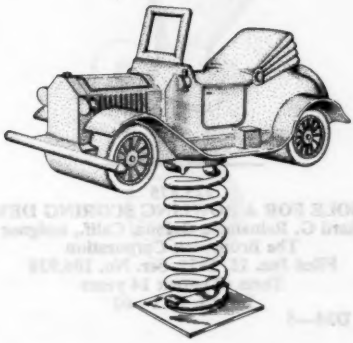
225,869
CALKED HORSESHOE
William Hartill, 60 Clifton Crescent, Sheffield S94 BE, England
Filed Apr. 14, 1971, Ser. No. 134,121
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—35

225,870
RACK FOR SMALL PARTS
Fred Morgison, 1010 Court St., Clay Center, Kans. 67432
Filed Mar. 8, 1971, Ser. No. 122,265
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D33—3

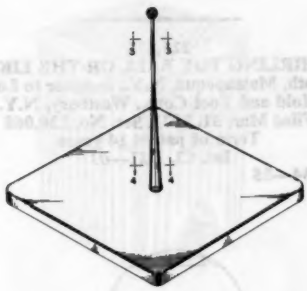


225,871
STUDY CARRELL
Clendon E. Crannell, 22 Washington Ave., Schenectady, N.Y. 12305
Filed Mar. 11, 1970, Ser. No. 21,848
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—11

225,872
ANTIQUE CAR BOUNCE RIDE
William J. Burke, Fond du Lac, Wis., assignor to The J. E. Burke Company, Fond du Lac, Wis.
Filed Aug. 5, 1971, Ser. No. 169,577
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5



225,873
INDOOR TABLE TOP TETHER BALL GAME STANDARD
Fred S. Anthony, Coos Bay, Oreg., assignor to Oregon Novelties, Inc., Coos Bay, Oreg.
Filed Mar. 1, 1971, Ser. No. 119,998
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

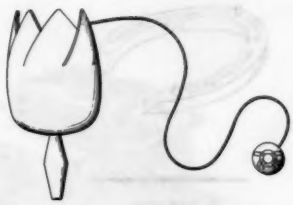


225,874
PEDESTAL FOR A BOWLER IDENTIFICATION PANEL FOR A BOWLING SCORING DEVICE
George E. Schaefer, Muskegon, Mich., assignor to The Brunswick Corporation
Filed Jan. 18, 1971, Ser. No. 107,617
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

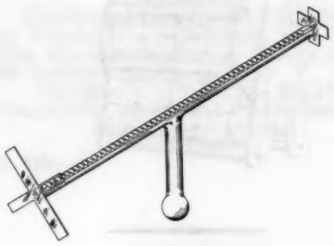
225,875
CONSOLE FOR A BOWLING SCORING DEVICE
Richard G. Reineman, Balboa, Calif., assignor to The Brunswick Corporation
Filed Jan. 15, 1971, Ser. No. 106,938
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

225,876
WHIRLING TOY BALL OR THE LIKE
William Vath, Massapequa, N.Y., assignor to Long Island Mold and Tool Corp., Westbury, N.Y.
Filed Mar. 31, 1971, Ser. No. 130,068
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

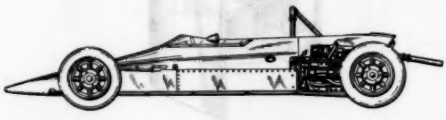
225,877
TETHER BALL PROJECTOR AND CATCHER TOY
Jack R. Bedient, 55 Richardson Drive, Henderson, Nev. 89015
Filed June 8, 1971, Ser. No. 151,165
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



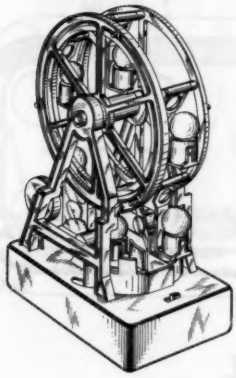
225,878
SPINNER TOY
Jimmy L. Taylor, 7130 Gaston Ave., Apt. 221, Dallas, Tex.
Filed Mar. 19, 1971, Ser. No. 126,378
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



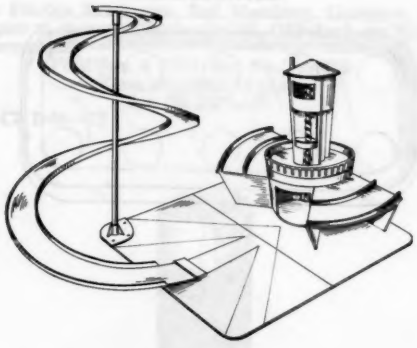
225,879
MODEL RACING CAR
Eric Harrison Broadley, Pangborne, near Reading, England, assignor to Lola Cars Limited, Slough, Buckinghamshire, England
Filed Apr. 29, 1971, Ser. No. 138,869
Claims priority, application Great Britain Oct. 31, 1970
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



225,880
TOY FERRIS WHEEL
Norman Spiegel, New York, N.Y., assignor to Nasta Industries Corporation, New York, N.Y.
Filed Feb. 25, 1971, Ser. No. 119,079
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

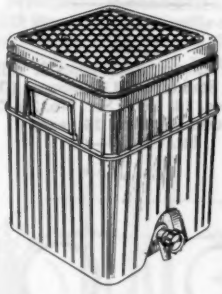


225,881
TOY AIRPORT STRUCTURE
Ernest L. Thornell, Horicon, Wis., assignor to Marlin Toy Products, Inc., Horicon, Wis.
Filed Feb. 17, 1971, Ser. No. 116,294
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

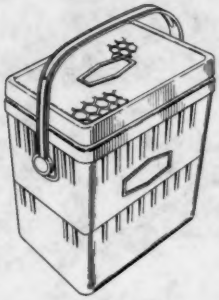


225,882
ROLY-POLY FIGURE TOY
Ernest L. Thornell, Horicon, Wis., assignor to Marlin Toy Products, Inc., Horicon, Wis.
Filed May 28, 1971, Ser. No. 148,280
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

225,883
INSULATED CHEST
Michael J. Di Pierro and Donald P. Mastrovito, Shrewsbury, Mass., assignors to Standard Oil Company, Chicago, Ill.
Filed Dec. 28, 1970, Ser. No. 26,656
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—1

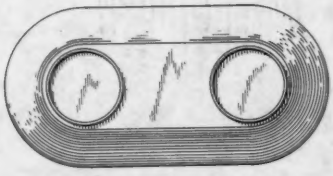


225,884
INSULATED ICE CHEST OR SIMILAR ARTICLE
Harvey Hanig, North Aurora, Ill., and Donald P. Mastrovito, Shrewsbury, Mass., assignors to Standard Oil Company, Chicago, Ill.
Filed Feb. 18, 1971, Ser. No. 116,736
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—1

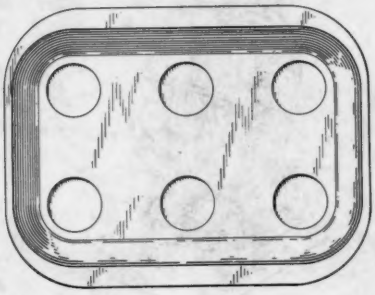


225,885
STEIN
Donald W. Doman, Janesville, and Lawrence K. Sauey, Baraboo, Wis., assignors to Flambeau Plastics Corporation, Baraboo, Wis.
Filed Feb. 25, 1971, Ser. No. 119,065
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—9

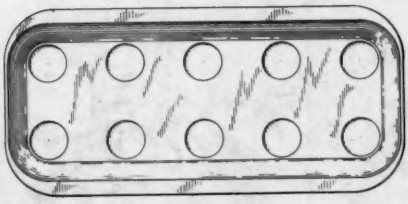
225,886
DISH
John T. Dolby, Winnetka, and James S. Adler, Chicago, Ill., assignors to Standard Oil Company, Chicago, Ill.
Filed Dec. 14, 1970, Ser. No. 26,474
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—10



225,887
TRAY
John T. Dolby, Winnetka, and James S. Adler, Chicago, Ill., assignors to Standard Oil Company, Chicago, Ill.
Filed Dec. 14, 1970, Ser. No. 26,475
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—10



225,888
TRAY
John T. Dolby, Winnetka, and James S. Adler, Chicago, Ill., assignors to Standard Oil Company, Chicago, Ill.
Filed Dec. 14, 1970, Ser. No. 26,476
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—10

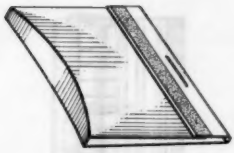


225,889
PASTRY FILLER HEAD
Eldred S. Scholes, Madison, Wis.
(% 5000 Wallace Ave., Monana, Wis. 53716)
Filed Dec. 14, 1970, Ser. No. 26,481
Term of patent 3½ years
Int. Cl. D7—*02*
U.S. Cl. D44—29

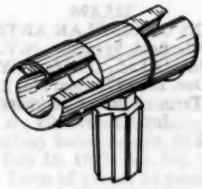
225,890
TABLE LAMP
Clive Entwistle, 44 E. 67th St., New York, N.Y. 10021
Filed Sept. 24, 1970, Ser. No. 25,179
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20

225,891
TABLE LIGHTER
Götz Florian Strzelczyk, Bad Homburg, Germany, assignor to Rowenta-Werke GmbH, Offenbach am Main, Germany
Filed Jan. 4, 1971, Ser. No. 103,952
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

225,892
MATCHBOOK COVER
Robert H. Knies, Fullerton, Calif., assignor to Hunt-Wesson Foods, Inc., Fullerton, Calif.
Filed May 28, 1971, Ser. No. 148,297
Term of patent 14 years
Int. Cl. D27—*04*
U.S. Cl. D48—29

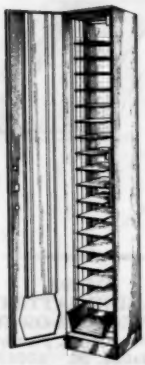


225,893
TOOL FOR CLEANING BATTERY TERMINALS AND CONNECTORS OR THE LIKE
James R. Dickinson, 546 E. Northwest Highway, Palatine, Ill. 60067
Filed May 19, 1971, Ser. No. 145,104
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D49—23



225,894
COMBINED CONTAINER AND DISPENSER FOR POWDERED MATERIALS
Jean Emery, 132 Rue Perronet, Neuilly-sur-Seine, France
Filed Jan. 14, 1971, Ser. No. 106,636
Term of patent 3½ years
Int. Cl. D9—*07*
U.S. Cl. D9—207

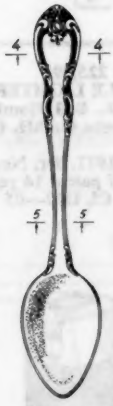
225,895
SHOE VENDING MACHINE
Kiyomitsu Ohno, Naka 2–9–9, Kunitachi-shi, Tokyo, Japan
Filed June 25, 1971, Ser. No. 157,075
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3



225,896
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 20, 1971, Ser. No. 210,294
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

225,897
VACUUM FORMING APPARATUS
Henry H. Jenkins, 864 W. Hacienda Drive, Corona, Calif.
Filed Jan. 28, 1971, Ser. No. 110,797
Term of patent 14 years
Int. Cl. D15—*09*

225,898
SPOON OR SIMILAR ARTICLE
Colin B. Richmond II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 29, 1971, Ser. No. 213,790
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12



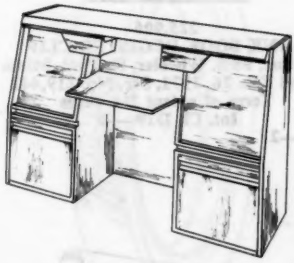
225,899
HOUSING FOR A RADIO-PHONOGRAPH OR SIMILAR ARTICLE
Harvey K. McQuarrie and Michael D. Tate, Kitchener, Ontario, Canada, assignors to Electrohome Limited, Kitchener, Ontario, Canada
Filed Mar. 3, 1971, Ser. No. 120,785
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4

225,900
EXPANDABLE HOLDER FOR A PAIR OF SPECTACLES
Helen G. Rafshoon, 3547 Buford Highway NE., Apt. G, Atlanta, Ga.
Filed Dec. 14, 1970, Ser. No. 26,434
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1

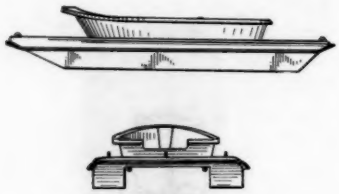
225,901
WATERPROOF PHOTOGRAPHIC CAMERA
Ohiko Yagi, Yokohama, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed July 14, 1971, Ser. No. 162,403
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1

225,902
ENLARGER
Karel Machacek and Danuse Mazurova, Prerov, Czechoslovakia, assignors to Meopta, nardoni podnik, Prerov, Czechoslovakia
Filed July 15, 1971, Ser. No. 163,118
Claims priority, application Czechoslovakia Jan. 20, 1971
Term of patent 7 years
Int. Cl. D16—*03*
U.S. Cl. D61—1

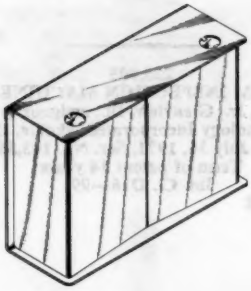
225,903
FILM INSPECTION MACHINE
Ray L. Short, Jr., Glenview, Ill., assignor to Research Technology Incorporated, Skokie, Ill.
Filed July 16, 1971, Ser. No. 163,553
Term of patent 14 years
Int. Cl. D16—*99*
U.S. Cl. D61—1



225,904
WATERCRAFT
John L. Critcher, 144 Bosley Ave., Cockeysville, Md. 21030
Filed Aug. 3, 1970, Ser. No. 24,286
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



225,905
CABINET FOR ELECTRONIC ALARM SYSTEM
Dale Lincoln, Lafayette, Calif., assignor to Systron-Donner Corporation, Concord, Calif.
Filed June 28, 1971, Ser. No. 157,819
Term of patent 14 years
Int. Cl. D29—*99*; D13—*99*
U.S. Cl. D72—1



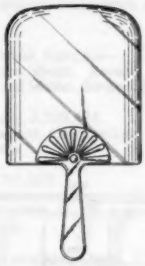
225,906
BANK BOOK REGISTER CLIP
Vincent C. Cline, 98 S. Wheeler, St. Paul, Minn. 55105
Filed Feb. 26, 1971, Ser. No. 119,442
Term of patent 3½ years
Int. Cl. D19—*99*
U.S. Cl. D74—2

225,907
MASSAGE ROLLER APPLIANCE
Desmond Kar-Yau Shiu, P.O. Box 1, Forest Row, Sussex, England
Filed Feb. 16, 1971, Ser. No. 115,904
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1

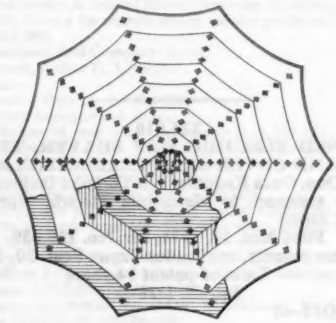
225,908
CLINICAL INSTRUMENT
Bernard McDonald, Malibu, Calif., assignor to Medical Testing Systems, Inc., Beverly Hills, Calif.
Filed Nov. 23, 1971, Ser. No. 201,608
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12

225,909
ASH TRAY
John C. Cramer, Dayton, Ohio, assignor to Dayton Coil Spring Co., Dayton, Ohio
Filed Feb. 12, 1971, Ser. No. 115,146
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D85—2

225,910
HAIR SPRAY SHIELD OR SIMILAR ARTICLE
Stanislau Kurianski, 24040 Gunther Road, Romoland, Calif. 92380
Filed Dec. 7, 1970, Ser. No. 26,309
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

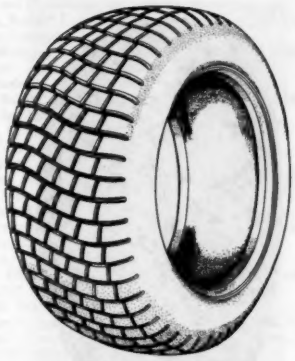


225,911
PARASOL COVER
Mary A. Morgan, 4522 Varble Ave., Louisville, Ky. 40211
Filed Apr. 29, 1971, Ser. No. 138,847
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3

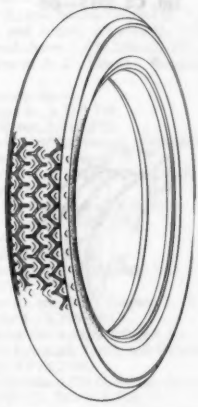


225,912
BICYCLE
Nobuyoshi Sekine, 78, 3-chome, Arakawa, Tokyo, Japan
Filed Mar. 16, 1971, Ser. No. 125,005
Claims priority, application Japan Sept. 16, 1970
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D90—8

225,913
TIRE
Yoshio Oita, Tantakabayashi, Japan, assignor to Dunlop Holdings Limited, Erdington, Birmingham, England
Filed Feb. 12, 1971, Ser. No. 115,147
Claims priority, application Japan Aug. 14, 1970
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



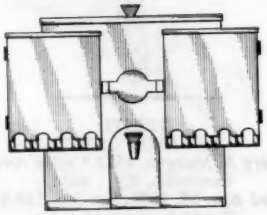
225,914
TIRE
Guido Bertazzoli, Milan, Italy, assignor to Industrie Pirelli, S.p.A., Milan, Italy
Filed Mar. 18, 1971, Ser. No. 125,914
Claims priority, application Italy Sept. 18, 1970
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



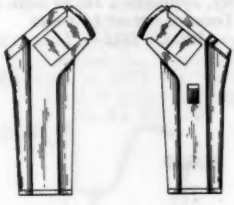
225,915
TIRE
Brian Leonard Wilcox, Birmingham, England, assignor to Dunlop Limited, Birmingham, England
Filed July 16, 1971, Ser. No. 163,563
Claims priority, application Great Britain Jan. 21, 1971
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20

225,916
YARN GUARD
George J. Matzel, Rego Park, N.Y., and Edward W. Schussel, King of Prussia, Pa., assignors to Stop-Motion Devices Corporation, Plainview, N.Y.
Filed Dec. 28, 1970, Ser. No. 26,681
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D92—15

225,917
HOT WATER DISPENSER
Charles C. Zahlman, Hackettstown, N.J., assignor to A.E.I. Corporation, Bethlehem, Pa.
Filed Nov. 18, 1970, Ser. No. 26,054
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D94—3



225,918
COMBINED ELECTRIC DRY SHAVER, TRIMMER AND COVER OR SIMILAR ARTICLE
Taisuke Ono, Oaza Kadoma, and Yoritaka Ikejima, Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Mar. 26, 1971, Ser. No. 128,639
Claims priority, application Japan Sept. 30, 1970
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF JANUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. F. fur Industrielle Elektronik Agie: *See—*
Ullmann, Werner; Derighetti, Renato; Tadini, Constantino; Farinelli, Roberto; and Mattei, Silvano, 3,710,067.

A/S Dansk Leca: *See—*
Kamstrup-Larsen, Harry, 3,709,474.

Abbott, Jack W., to Garrett Corporation, The. Centrifuge vent. 3,709,428, Cl. 233-19.00a.

Abbott Laboratories: *See—*
Burke, Charles R., 3,709,985.
Macalalad, Fidel Villaluna; and Katerndahl, Dean R., 3,709,223.

Abbotts, William Edward, to Rhodes, B., & Son, Limited. Flowmeters. 3,709,037, Cl. 73-231.000.

Abe, Koichi: *See—*
Murayama, Masayuki; and Abe, Koichi, 3,709,928.

Abe, Takuzi; and Yuda, Minoru, to Tokyo Shibaura Electric Co., Ltd. TV Receiver concurrently acting as a monitor. 3,710,017, Cl. 178-6.800.

Abel, Heinz: *See—*
Toepfl, Rosemarie; Abel, Heinz; and Maeder, Arthur, 3,709,847.

Aboutboul, Henri A.: *See—*
Krekeler, Jerome H.; Wehr, Charles H.; and Aboutboul, Henri A., 3,709,664.

Abramov, Viktor Petrovich; Junga, Yan Petrovich; Berzin, Gunard Valdemarovich; Skrupsky, Voldemar Petrovich; Frolov, Petr Nikolaevich; Lugovskoi, Andrei Lukyanovich; Shilgorin, Felix Alexandrovich; Dalbinsh, Yan Yanovich; Rotsen, Karl Arturovich; Ziemelis,Andris Eduardovich; Elksnis, Artur Yanovich; and Priede, Bruno Andreevich, to Institut Rhimii Drevesiny Akademii Nauk Latviiskai SSR. Device for manufacturing tubular products. 3,709,270, Cl. 144-268.000.

Abrasive Diamond Tool Company: *See—*
Kohlstrunk, Arthur T., 3,709,207.

ABUVA: *See—*
Gluchowicz, Gerszon, 3,708,922.

ACF Industries, Incorporated: *See—*
Cook, Robert M.; and Goldman, Charles B., 3,709,151.

Acquavia, Thomas J., Jr., to Xerox Corporation. Control circuit for sorting system. 3,709,485, Cl. 271-57.000.

Adamovske strojirny, narodni podnik: *See—*
Stepanek, Karel; and Jurny, Josef, 3,709,048.

Adams, George; and Hawkins, John, to United Research Laboratory. Removable magnetic head assembly with lifters fingers. 3,710,037, Cl. 179-100.20r.

Adams, Jerry. Coiled material dispenser. 3,709,445, Cl. 242-55.200.

Adams, William J.; and Ferrari, Eugene A. Closed-damper indicator for fireplace. 3,708,897, Cl. 40-1.000.

Addis, John L.; and Peltola, Ronald W., to Tektronix, Inc. Linear gain control. 3,710,270, Cl. 330-29.000.

Addressograph Multigraph Corporation: *See—*
Schulze, Erwin F. C.; and Baker, Robert G., 3,709,480.

Addressograph-Multigraph Corporation: *See—*
Sims, Art T., 3,709,144.

Adjustable Bushing Corporation: *See—*
Pitzer, Kenneth H., 3,709,088.

Adlhart, Otto J.; and Terry, Peter L., to Engelhard Minerals & Chemicals Corporation. Fuel cell system comprising non-circulating, counter-current gas flow means. 3,709,736, Cl. 136-86.00r.

Adrian, Donald J.: *See—*
Hinchman, Walter R.; Adrian, Donald J.; and Walters, Andrew W., 3,710,387.

Advanced Management Engineering & Research Co.: *See—*
Ryden, James W., 3,709,523.

Ageev, Leonid Matveevich: *See—*
Vydrin, Vladimir Nikolaevich; and Ageev, Leonid Matveevich, 3,709,017.

Agence Nationale de Valorisation de la Recherche: *See—*
Anthony, Anne-Marie, nee Barbier; Faucher, Michele, nee Dufre; and Dembinski, Krzysztof, 3,709,998.
Bonnemay, Maurice G.; Bronoel, Guy R.; and Doniat, Denis, 3,709,735.

Agfa-Gevaert: *See—*
Florens, Raymond Leopold; Claes, Frans Henri; and Moisar, Erik, 3,709,689.

Agfa-Gevaert Aktiengesellschaft: *See—*
Haase, Gunter; and Schopper, Erwin, 3,709,692.
Zahn, Wolfgang; Findeis, Gunter; and Muller, Dieter, 3,709,601.
Zahn, Wolfgang; Friedrich, Gunther; and Weinert, Volker, 3,709,613.

Aguilar, Henry. Suspendiable support for articles and method. 3,709,373, Cl. 211-113.000.

Aid For Business, Incorporated: *See—*
McKee, James B.; and Canaday, Joh L., 3,709,524.

Aine, Harry E. Microwave applicator. 3,710,063, Cl. 219-10.550.

Ainoura, Masato, to Tsukihoshi Gomu Kabushiki Kaisha and Kabushiki Kaisha Kashifuji Tekkosho. Screw-shaped gear hone and method of forming and using the same. 3,708,925, Cl. 51-206.00p.

Air Cushion Vehicles, Inc.: *See—*
Ferguson, Hugo S., 3,709,318.

Air Products and Chemicals, Inc., mesne: *See—*
Tedeschi, Robert J.; and Moore, George L., 3,709,946.

Air Reduction Company, Incorporated: *See—*
Shattes, Walter J.; and Marancik, william G., 3,710,000.

Airco, Inc.: *See—*
Hunt, Charles d'A., 3,709,284.
Shrader, Robert L.; and Tsujimoto, Kazumi N., 3,710,072.

Aisin Seiki Kabushiki Kaisha: *See—*
Kazaoka, Kenichi; and Torii, Nozomu, 3,709,537.
Kondo, Toshiyuki; and Kozakai, Asao, 3,709,334.
Miyake, Hirotaka; and Kawai, Shinji, 3,709,568.
Murakami, Noboru; Naruto, Tatsuo; and Hashimoto, Nobuyuki, 3,709,340.

Aizu, Keiichiro; Kumada, Akio; and Koga, Masashi, to Hitachi, Ltd. Control of microwave power by applying stress to gadulinium molylate single crystal. 3,710,286, Cl. 333-81.00b.

Ajinomoto Co., Inc.: *See—*
Otsuka, Shinichiro; Honda, Takeshi; and Yamanoi, Akio, 3,709,785.

Akio, Kurisaki: *See—*
Kunichika, Sango; Sakaibara, Yasumasa; Kyotofu, Noguchi; Akio, Kurisaki; Konomu, Kato; and Uchiyama, Mitsuru, 3,709,927.

Aktiebolaget Stille Werner: *See—*
Hessner, Hans; and Nilsson, Per Olof, 3,709,441.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Iten, Paul D., 3,709,599.
Strubin, Harald, 3,710,298.

Alarm Device Manufacturing Company: *See—*
Guthart, Leo A., 3,710,134.

Albers, Kenneth H.; Blood, Alden E.; and Snapp, Thomas C., Jr., to Eastman Kodak Company. Polyesteramide coating compositions. 3,709,858, Cl. 260-29.20n.

Albertson, Robert V. Snowmobile stabilizing device. 3,709,512, Cl. 280-28.000.

Alexander, Larry T. Intravenous supply container support. 3,709,372, Cl. 211-74.000.

Alferov, Jury Fedorovich: *See—*
Medovar, Boris Izrailevich; Popov, Viktor Andreevich; Alferov, Jury Fedorovich; Bogachenko, Alexey Georgievich; and Latash, Jury Vadimovich, 3,709,997.

Alger, Martin J., Jr.; and Dunn, Nelson H., to General Signal Corporation. Steel cylinder barrel having bonded bronze-iron valve plate. 3,709,107, Cl. 92-169.000.

Alger, Martin J., Jr.; and Dunn, Nelson H., to General Signal Corporation. Steel cylinder barrel having bonded bronze-iron liners. 3,709,108, Cl. 92-169.000.

Allard, Charles D.: *See—*
Allard, Eugene R.; and Allard, Charles D., 3,709,556.

Allard, Eugene R.; and Allard, Charles D. Telescoping IV pole attachment and wheel chairs. 3,709,556, Cl. 297-188.000.

Allen, Alaric, to Cossor, A. C., Limited. Secondary radar. 3,710,382, Cl. 343-6.50r.

Allen-Bradley Company: *See—*
Burton, Lawrence A., 3,710,198.
Dummermuth, Ernst, 3,710,222.
Radtke, Joseph D.; and Kiffmeyer, William W., 3,710,378.

Allied Chemical Corporation: *See—*
Lofquist, Robert Alden; Crescentini, Lamberto; and Wincklhofer, Charles, 3,709,865.

Allied Farm Equipment (Manitoba), Ltd.: *See—*
Crawley, Harry Donald, 3,709,356.

Allis-Chalmers Corporation: *See—*
Sieren, Gerald E., 3,709,344.

Allis-Chalmers Manufacturing Company: *See—*
Haupt, Robert C., 3,709,304.
Johnson, Wayne E.; and Korb, Eugene V., 3,709,520.
McGehee, Archie L., 3,709,393.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Landa, Torstein; Syvakari, Pertti; and Westman, Erik, 3,709,014.
Uhlmann, Erich, 3,710,284.

Alm, Robert M., to Standard Oil Company (Indiana). Petroleum coke acid salts. 3,709,930, Cl. 260-515.00h.

Alphonse, Gerard Argant, to RCA Corporation. Apparatus for efficiently converting microwave energy into acoustic energy. 3,710,283, Cl. 333-30.00r.

Altemus, William C.; and Duca, James, to Computer Image Corporation. System for automatically producing a color display of a scene from a black and white representation of the scene. 3,710,011, Cl. 178-5.40e.

Alter, Vladimir Fedorovich: *See—*
Pokhodnya, Igor Konstantinovich; Shlepakov, Valery Nikolaevich; and Alter, Vladimir Fedorovich, 3,710,073.

Altgauzen, Andrei Pavlovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.

Altherr, Russell G., to Amsted Industries Incorporated. Connection for articulated car. 3,709,376, Cl. 213-62.00r.

Althoff, F. Dankward, to Brown Boveri & Cie AG. Fault current protective circuit for a load supplied from single or polyphase systems. 3,710,190, Cl. 317-18.00d.

Aluminum Company of America: *See—*
Severs, John W., 3,709,549.

Aluotto, Antonio; d/b/a National Baling Press and Equipment Co.: *See—*
Aluotto, Dominick M., 3,708,953.

Aluotto, Dominick M., to Aluotto, Antonio; d/b/a National Baling Press and Equipment Co. Waste compactor and bagger. 3,708,953, Cl. 53-124.00b.

Alzmann, Walter. Variable photographic mask for maintaining multiple constant proportions of a visible area. 3,709,591, Cl. 355-126.000.

Amamiya, Ikuzou, to Kabushiki Kaisha Kanagawaseisakusho. Method of making nonskid studs for tires and shoes. 3,708,868, Cl. 29-520.000.

Amamiya, Tameo: *See—*
Sada, Tomohiko; Tsuchiya, Noriyuki; Amamiya, Tameo; Kaneda, Yoko; and Ohta, Kazuyuki, 3,710,195.

Ambros, Rafael Foguet; Beerwald, Alexander; and Lang, Arnold, to Electro-Quimica de Flix S.A. Method for drying gases. 3,708,955, Cl. 55-31.000.

American Cyanamid Company: *See—*
Grethlein, Hans Erich; and Prescott, William Benjamin, 3,710,345.
Strazdins, Edward, 3,709,708.

American Forest Products Corporation: *See—*
Stapp, William C., 3,709,425.

American Formed Plastics Corporation: *See—*
McLaughlin, Thomas M., 3,708,997.

American Hydrocarbon Company: *See—*
Proell, Wayne A.; Selin, Clifford E.; Holbrook, Stanford T.; and Hammond, Francis H., 3,709,931.

American Limnetics Instruments, Inc.: *See—*
King, Karl Lewis; and Arrington, James R., 3,709,796.

American Optical Corporation: *See—*
Berkovits, Barough V., 3,709,229.

American Safety Equipment Corporation: *See—*
Gonzalez, Teodoro J., 3,708,838.
Jakob, Hans, 3,709,558.

American Standard, Inc.: *See—*
Karp, Joseph G., Jr.; and McCurdy, Robert F., 3,708,916.

American Velcro, Inc.: *See—*
Ribich, William A.; Kojabashian, Charles; and Girard, Lauret H., 3,708,833.

Ameron, Inc.: *See—*
Coleman, Fred K., 3,708,984.

Ametek, Inc.: *See—*
Chesterton, Stanley Keith, Jr.; and Samph, William J., 3,710,250.

AMF Incorporated: *See—*
Ingham, John W., Jr., 3,709,317.

Amin, Shirish Chandubhai; Jones, David Henry; and Maxwell, Donald Robert, to May & Baker Limited. 10-(3-Dimethylamino-2-methylpropyl)-2-valerylphenothiazine. 3,709,879, Cl. 260-243.0aa.

Amman, Roy E. Electrician's wire bending tool. 3,709,264, Cl. 140-106.000.

AMP Incorporated: *See—*
Floyd, Edwin, Jr., 3,708,873.
Mann, Richard Charles, Sr.; and Schwalm, Glendon Henry, 3,708,878.
Schor, Ferdinand William; and Fritz, William Baird, 3,710,285.
Till, James Peter, 3,710,252.

Ampex Corporation: *See—*
Dao, Tich T., 3,710,276.
Sonberg, Charles M., 3,710,361.

Amsden, Carl D.; and Galeano, Sergio F., to Owens-Illinois, Inc. Method for the oxidation of black liquor. 3,709,975, Cl. 423-206.000.

Amsted Industries Incorporated: *See—*
Altherr, Russell G., 3,709,376.

Anderson Bros. Mfg. Co.: *See—*
Wilke, Howard C.; and Williams, Romaine A., 3,708,954.

Anderson, Charles B.; and Tuggle, William H., Jr., to Atco Rubber Products, Inc. Stretch clamp. 3,708,834, Cl. 24-279.000.

Anderson, Daniel C. Method of preparing stereotype plates. 3,708,869, Cl. 29-527.500.

Anderson, Greenwood & Co.: *See—*
Weise, Irvin B., 3,709,258.

Anderson, Karl R., to Thompson, John T. Gang connector assembly for telephone cable terminal board. 3,710,046, Cl. 200-51.00r.

Anderson, Nils T., to Crown Zellerbach Corporation. Multiple layer limited dielectric recording blank for pulse printing. 3,709,728, Cl. 117-218.000.

Anderson, Quinn S.; Levin, Berton P.; and Thomson, Jackie D., to Sierracin Corporation, The. Coating control system. 3,709,192, Cl. 118-8.000.

Anderson, Wallace G. Plural motor timing sequence system. 3,710,214, Cl. 318-102.000.

Anderson, William S., to Shell Oil Company. Process for light-induced curing of epoxy resin in presense of cyclopentadienylmanganese tricarbonyl compounds. 3,709,861, Cl. 260-47.0ec.

Andersson, Tage Vilhelm Leander; Isheden, Lars Rune; Johansson, Bo Emil; and Warring, Stig Erik, to Telefonaktiebolaget L M Ericsson. Alarm system for monitoring a plurality of serially connected objects utilizing signal translation techniques. 3,710,372, l. 340-276.000.

Andrews, Brian; Pilkington, James Christopher; and Riley, Brian William, to Pilkington Brothers Limited. Packages of glass in sheet form. 3,709,358, Cl. 206-62.00r.

Andrews, Douglas R.; deceased (by Andrews, Marjorie E.); and Kimmel, Milton J., said Kimmel assor. to International Business Machines Corporation. Pattern-size normalizing for recognition apparatus. 3,710,323, Cl. 340-146.30h.

Andrews, Marjorie E.: *See—*
Andrews, Douglas R.; and Kimmel, Milton J., 3,710,323.

Ansund, Bo Kent, to MacGregor International S.A. Hatch cover drive means. 3,708,914, Cl. 49-209.000.

Anthony, Anne-Marie, nee Barbier; Faucher, Michele, nee Dufre; and Dembinski, Krzysztof, to Agence Nationale de Valorisation de la Recherche. Heating element for an electric furnace. 3,709,998, Cl. 13-25.000.

Ao, Takeo, to Osaka Yogyo Kabushiki Kaisha. Method for the preparation of a catalyst usable for catalytic cracking of hydrocarbons. 3,709,832, Cl. 252-429.00r.

Aoki, Fumio: *See—*
Watanabe, Seizi; Ozaki, Kozo; Oishi, Hiroshi; Aoki, Fumio; and Kawano, Shigeru, 3,710,373.

Aoki, Yoshiatsu: *See—*
Samejima, Hirotoshi; Furuya, Akira; Shimaoka, Keiji; and Aoki, Yoshiatsu, 3,709,701.

Apitz, Peter F., to Tamar Electronics, Inc. System for computing the average of successive traffic measurements. 3,710,081, Cl. 235-150.240.

APL Corporation: *See—*
Verbeke, Henry, 3,709,347.

Appius, Max K., to Mettler Instrumente AG. Top-loading balance. 3,709,311, Cl. 177-203.000.

Arazi, Efraim: *See—*
Levin, Arie; and Arazi, Efraim, 3,710,020.

Arenco Aktiebolag: *See—*
Lilja, Lars Edvin; and Wallberg, Erik Arne, 3,709,232.

Arenson, A., Limited: *See—*
Rutherford, Frank; Arenson, Ivor Gerald; Cracknell, Alan George; Foulds, William Henry; and Derrick, Albert, 3,709,577.

Arenson, Ivor Gerald: *See—*
Rutherford, Frank; Arenson, Ivor Gerald; Cracknell, Alan George; Foulds, William Henry; and Derrick, Albert, 3,709,577.

Aries Electronics, Inc., mesne: *See—*
Weisenburger, Lawrence P., 3,710,299.

Armco Steel Corporation: *See—*
Palmour, Harold H., 3,709,292.

Armstrong Cork Company: *See—*
Baymiller, John W., 3,708,889.
Herweh, John E.; and Poshkus, Algirdas C., 3,709,844.

Armstrong, Neil J.: *See—*
McConnell, Frederick C.; Jason, George; and Armstrong, Neil J., 3,709,607.

Arneson, Edwin L., to Federal Paper Board Company, Inc. Article carrier. 3,709,400, Cl. 220-113.000.

Arrington, James R.: *See—*
King, Karl Lewis; and Arrington, James R., 3,709,796.

Artemiev, Vladimir Dmitrievich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Tokutomi, Seijiro, 3,709,123.

Asakawa, Shirow: *See—*
Yoshimura, Susumu; Asakawa, Shirow; and Hasegawa, Katsue, 3,709,820.

Aschberger, Anton A., to Continental Can Company, Inc. Forge roll for welding of thin-wall tubing. 3,708,845, Cl. 29-132.000.
Aselman, Edward C., Jr., to TNE Incorporated. Vibration detection apparatus. 3,709,030, Cl. 73-71.100.
Ashcraft, William D., to North American Rockwell Corporation. Signal-correlating apparatus for improving the angular resolution of a directionally ranging system. 3,710,384, Cl. 343-7.00a.
Ashkin, Arthur, to Bell Telephone Laboratories, Incorporated. Apparatuses for trapping and accelerating neutral particles. 3,710,279, Cl. 331-94.500.
Ashmele, Anton, to Trossinger Metallstimmenfabrik Hans Eisen. Sound reproducing apparatus. 3,709,505, Cl. 274-23.00r.
Aspro-Nicholas Limited: *See—*
Gittos, Maurice Ward; James, John William; and Wiggins, Leslie Frederick, 3,709,996.
Atco Rubber Products, Inc.: *See—*
Anderson, Charles B.; and Tuggle, William H., Jr., 3,708,834.
Atlantic Richfield Company: *See—*
Lincoln, Robert M.; and Meyers, Joseph A., III, 3,709,778.
Attwell, Ronald Leslie: *See—*
Whitbread, John Edgar; and Attwell, Ronald Leslie, 3,709,116.
Auchapt, Rene; and Gerard, Michel Jullien, to L'Equipement General Electrique "Egelec". Quick-break electric switch. 3,710,053, Cl. 200-67.00b.
Audi Nsu Auto Union Aktiengesellschaft: *See—*
Behles, Franz G., 3,709,139.
Augstein, Joachim: *See—*
Leeming, Peter R.; Cross, Peter E.; Cox, David A.; and Augstein, Joachim, 3,709,892.
Augustine, Paul C.: *See—*
Peisner, Israel D.; Deshetler, Louis K.; and Augustine, Paul C., 3,709,154.
Auler, Herbert; and Josef, Muskat, to Passavant Werke. Floating surface aerator. 3,709,470, Cl. 261-91.000.
Aumuller, Walter: *See—*
Welmut, Weber; Weyer, Rudi; Aumuller, Walter; Muth, Karl; and Stach, Kurt, 3,709,908.
Aurich, Christoph W.; Bryant, John C.; and Riley, James R., to Gaston Country Dyeing Machine Company. Multiple valve module. 3,709,248, Cl. 137-271.000.
Austin, James, to Occidental Research & Engineering Limited. Process for producing liquid NP fertilizers. 3,709,675, Cl. 71-35.000.
Austin, Max M.; and Boulton, Norman B., to National-Standard Company. Band clutch assembly. 3,709,339, Cl. 192-41.00s.
Austria Tabak Werke Aktiengesellschaft: *See—*
Marek, Josef; and Hayn, Gunther, 3,709,274.
Auto Anti-Pollution Devices of Canada Limited: *See—*
Ciotti, Antonio Pasquale, 3,709,255.
Automatic Switch Co., mesne: *See—*
Beeken, Basil B., 3,709,027.
Automobiles Peugeot: *See—*
Lombard, Claude; and Piret, Jean, 3,709,070.
Auzel, Francois E. Fluorescent materials for optical frequency conversion. 3,709,827, Cl. 252-301.40r.
Avco Corporation: *See—*
Rogers, Cedric G., 3,708,936.
Avital, Ron, to Israel Aircraft Industries Ltd. Helicopter lighting system and light units useful therein. 3,710,311, Cl. 340-27.000.
AVM Corporation: *See—*
Johnson, Jesse R., 3,709,461.
Ayaki, Kazuo, to Nippon Electric Company Limited. Multi-stage type microwave amplifier. 3,710,272, Cl. 330-53.000.
Babcock & Wilcox Company, The: *See—*
Evans, Sidley O., 3,709,020.
Gauger, Edward A., Jr.; Brown, Wallace H.; and Gartner, William J., 3,709,169.
Babcock, Gordon L.: *See—*
Warren, Gary J.; and Babcock, Gordon L., 3,710,107.
Bachle, Karl; Finkbeiner, Ludwig; and Taubitz, Bernd, to Bosch, Robert, G.m.b.H. Alternating current generator with radial stator poles. 3,710,158, Cl. 310-156.000.
Badian, Abraham: *See—*
Miller, Robert Pincus; Badian, Abraham; and Dickstein, Samuel P., 3,710,319.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Fischer, Erhard; and Wegner, Gerhard, 3,709,860.
Goetze, Walter; Kasper, Werner; Klatt, Gerhard; and Schulz, Gerhard, 3,709,945.
Kohlhaupt, Reinhold; and Becke, Friedrich, 3,709,895.
Krauch, Carl Heinrich; and Sanner, Axel, 3,709,805.
Baglai, Vitaly Mikhailovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.
Bailey, Malcolm; and Downer, John Colin, to Conder International Limited. Ceiling system. 3,708,932, Cl. 52-232.000.
Baillie, Alan J.: *See—*
Gutoski, Jerome; and Baillie, Alan J., 3,709,650.
Baird, William C., Jr.; and Surridge, John H., to Esso Research and Engineering Company. Method of forming dicyano compounds. 3,709,921, Cl. 260-465.003.
Baird-Atomic, Inc., mesne: *See—*
Miles, John L., 3,709,765.
Baker, Arthur R.; Brant, William; and Danielson, Clarence J., to Xerox Corporation. Sorting apparatus. 3,709,492, Cl. 271-64.000.
Baker, Donal E., to Westinghouse Electric Corporation. D.C. static switch including means to suppress transient spikes between a drive source and the switch element. 3,710,231, Cl. 323-9.000.
Baker Oil Tools, Inc.: *See—*
Curington, Alfred R., 3,709,306.
Baker, Ralph W.; McCarthy, John H.; Place, Harold G.; and Wikman, Andrew O., to Ethyl Corporation. Manufacture of halohydrocarbons. 3,709,950, Cl. 260-659.00a.
Baker, Raymond N. Mechanized collection of solid waste material. 3,709,360, Cl. 209-215.000.
Baker, Robert G.: *See—*
Schulze, Erwin F. C.; and Baker, Robert G., 3,709,480.
Balda Werke Photographische Gerate und Kunststoff R. Gruter Kommanditgesellschaft: *See—*
Langewiesche, Wilhelm; and Lange, Karl Heinz, 3,709,120.
Balda-Werke: *See—*
Lange, Karl-Heinz, 3,709,129.
Baldwin, D. H., Company: *See—*
Brean, John W., 3,710,375.
Ball Brothers Research Corporation: *See—*
Munson, Robert E., 3,710,338.
Ballas, George C.: *See—*
Geist, Thomas N.; and Ballas, George C., 3,708,967.
Balliett, John W.; and Sherwood, William T., to Eastman Kodak Company. Reflective device for color separation. 3,710,010, Cl. 178-5.40r.
Bally Manufacturing Corporation: *See—*
Lally, Joseph Edward, 3,709,493.
Banger Punta Operations, Inc.: *See—*
Taccone, Russell W., 3,709,282.
Banks, Donald S., to Raytheon Company. Radar scanning method and apparatus. 3,710,388, Cl. 343-16.00r.
Banks, Ronald Eric: *See—*
Haszeldine, Robert Neville; Banks, Ronald Eric; and Taylor, David Robin, 3,709,948.
Banning, J., Aktiengesellschaft: *See—*
Wieting, Eugen; and Siepmann, Hans, 3,709,011.
Bansho, Kiyoshi: *See—*
Tanaka, Tetsuro; and Bansho, Kiyoshi, 3,710,275.
Barba, John J., to Olesen, Larry F. and Olesen, Virginia A. Smoke control device. 3,709,171, Cl. 110-8.00r.
Barbacsy, Ludwig Benno; Muck, Gunther; and Plantikow, Ulrich, to Messerschmitt-Bolkow-Blohm GmbH. Magnetohydrodynamic (MHD) alternating current generator. 3,710,153, Cl. 310-11.000.
Barber-Colman Company: *See—*
Koch, A. Richard, 3,710,220.
Barker, Donald E. Apparatus for facial stimulation. 3,709,228, Cl. 128-410.000.
Barker, Michael D.: *See—*
Boyce, Clive B. C.; Barker, Michael D.; and Wood, Jack, 3,709,902.
Barkley, William. Submarine home. 3,708,991, Cl. 61-69.000.
Barlow, Gordon A., to Glass, Marvin, & Associates. Baseball game. 3,709,494, Cl. 273-89.000.
Barlow, Gordon A., to Glass, Marvin, & Associates. Marble type board game apparatus. 3,709,497, Cl. 273-130.000.
Barnes, Forrest G. Electronic smoke detector. 3,710,365, Cl. 340-237.00s.
Barnes, Michael W.: *See—*
McDowell, Curtis S.; and Barnes, Michael W., 3,709,920.
Barnhart, Charles Calvin, to Clear Pack Company. Apparatus for forming an embossed thermoplastic sheet. 3,709,647, Cl. 425-224.000.
Barnum, Thomas G., to General Motors Corporation. Lamp failure indicator for a dual-filament lamp. 3,710,367, Cl. 340-251.000.
Barr-Stalfort Company: *See—*
Cunningham, Ernest R., 3,709,410.
Barrager, Stephen M.; and Smith, Sidney H., to International Business Machines Corporation. Method and apparatus for testing batch fabricated magnetic heads during manufacture utilizing a magnetic filed generated by a current carrying conductor. 3,710,23, Cl. 324-34.00r.
Barrera, Roberto Gonzalez: *See—*
Rubio, Manuel J., 3,709,696.
Barrett, Paul Anthony, to Wellcome Foundation, Ltd., The. Substituted glyoxal dithiosemicarbazones. 3,709,935, Cl. 260-552.0sc.
Bartok, Stephen, to Litton Business Systems, Inc. Magnetic transducer components. 3,710,309, Cl. 339-217.00s.
Barton, George C., to USM Corporation. Heel seat molding and lasting machines. 3,708,814, Cl. 12-12.500.
Basner, Ernest L., to Sealy, Inc. Edge support for a spring unit. 3,708,809, Cl. 5-260.000.
Basse, Philip; and Sposato, Frank J., to Logimetrics, Incorporated. Frequency control of oscillators using digital techniques. 3,710,274, Cl. 331-1.00a.
Bata Shoe Company, Inc.: *See—*
Maltby, Frank V., 3,709,973.

Bates, Kenneth T.; and Hoare, Michael R., to Westinghouse Canada Limited. Vacuum induction heat treatment of long tubular products. 3,709,999, Cl. 13-26.000.

Bates, Marcus L., to Williamson, T. D., Inc. Apparatus for communicating service lines to mains. 3,709,250, Cl. 137-318.000.

Batz, Monika, to Telefunken Patentverwerlungsgesellschaft m.b.H. Semiconductor device having a screen electrode of intrinsic semiconductor material. 3,710,204, Cl. 317-235.00r.

Bauer Bros. Co., The: *See—*
Michel, Donald P.; Steinige, Herman; Landis, Franklin F.; and Skeen, Lawrence, 3,709,443.

Bauer, Werner R., to Robertshaw Controls ompany. Strip chart drive mechanism for a recorder. 3,710,343, Cl. 346-136.000.

Baumer, Albrecht; and Schubler, Karl-Heinz, to Dango & Dienenthal Kommanditgesellschaft. Mechanism for swinging a taphole gun. 3,709,477, Cl. 266-42.000.

Baur, Hugo: *See—*
Tischner, Horst; Schief, Alfred; and Baur, Hugo, 3,710,332.

Baxter Laboratories, Inc.: *See—*
Cromie, Harry W., 3,709,526.
Martinez, Felix Jesus, 3,709,367.
Seitz, Lamont J.; and Hauser, Stephen G., 3,709,538.

Baymiller, John W., to Armstrong Cork Company. Apparatus for bleaching furniture. 3,708,889, Cl. 34-83.000.

Beach, David E., to Eastman Kodak Company. Film metering mechanism. 3,709,128, Cl. 95-31.0fm.

Beaman, Clayton E. Tire changing machine adapter. 3,709,279, Cl. 157-1.240.

Beard, Albert L.: *See—*
Hunter, John C.; and Beard, Albert L., 3,710,328.

Beatenbough, Paul K.: *See—*
Scherer, Carl A.; and Beatenbough, Paul K., 3,708,998.

Beatrice Foods Co.: *See—*
Gore, William C.; and Shapiro, Eugene B., 3,709,256.

Bechem, Werner: *See—*
Hox, Hans Werner; and Bechem, Werner, 3,709,018.

Becke, Friedrich: *See—*
Kohlhaupt, Reinhold; and Becke, Friedrich, 3,709,895.

Becker, Erwin; and Schutte, Rolf, to Gesellschaft fur Kernforschung m.b.H. Device for the separation of gaseous or vaporous substances, especially isotopes, with different molecular weights and/or different gas kinetic cross sections. 3,708,964, Cl. 55-39.000.

Beckham, Clarence F.: *See—*
Killinger, Gordon B.; and Beckham, Clarence F., 3,709,694.

Beckman Instrument, Inc.: *See—*
Chase, Charles P., 3,709,242.

Beckman Instruments, Inc.: *See—*
Carleton, Joseph G.; McEwen, Cassius R.; and Williams, Frederick G., Jr. (said Carleton and said McEwen assors. to), 3,708,948.
Robinson, Dale D., 3,710,120.

Beckwith, Clinton H.: *See—*
Field, Thomas R.; and Beckwith, Clinton H., 3,709,236.

Bedrosian, Paul H., to United States of America, Health, Education, and Welfare. Shipping container for radioactive material using safety closure devices. 3,710,121, Cl. 250-108.00r.

Beebe, James H.: *See—*
Trogan, John F.; and Beebe, James H., 3,709,077.

Beehler, Richard F., to Lau Incorporated. Vibration damping hub propeller type fans. 3,708,999, Cl. 64-11.00r.

Beehler, Richard F., to Lau Incorporated. Shaft and hub assembly and improved clip fastener therefor. 3,709,531, Cl. 287-53.00h.

Beeken, Basil B., to Automatic Switch Co., mesne. Proximity sensing device. 3,709,027, Cl. 73-37.500.

Beerbower, Alan: *See—*
Nixon, James; Wallace, Thomas J.; and Beerbower, Alan, 3,709,747.

Beerman, Ludovicus Johannes, to Quebec Iron and Titanium Corporation. Furnace electrode seal. 3,709,506, Cl. 277-12.000.

Beerwald, Alexander: *See—*
Ambros, Rafael Foguet; Beerwald, Alexander; and Lang, Arnold, 3,708,955.

Beggs, James E., to General Electric Company. Quick-heating impregnated planar cathode. 3,710,161, Cl. 313-346.000.

Behforouz, Mohammad, to Monsanto Company. Dithioamides. 3,709,907, Cl. 260-326.00s.

Behles, Franz G., to Audi Nsu Auto Union Aktiengesellschaft. Device for supplying air into the interior of motor vehicles. 3,709,139, Cl. 98-2.160.

Behn, Reinhard; Gottlob, Heinrich; Hoyler, Gerhard; and Kessler, Hartmut. Front contacted electrical component. 3,710,211, Cl. 317-261.000.

Behrenbruch, Horst: *See—*
Frischkorn, Hans; and Behrenbruch, Horst, 3,709,896.

Beijering, Willem, to Van Poppel, Gebrs., N.V. Cigarette lighter. 3,709,655, Cl. 431-344.000.

Beilis, Herbert J. Turn lock. 3,709,540, Cl. 292-204.000.

Belkovsky, Viktor Alexandrovich; Grzhimalsky, Leopold Leopoldovich; Ilievsky, Irma Irmovich; Lotsmanov, Sergei Nikolaevich; Petrunin, Ivan Egorovich; Sukhov, Anatoly Vasilievich; Tikhonov, Boris Sergeevich; Levin, Boris Isaakovich; Moroz, Pavel Kirillovich Strekalov, Genrikh Nikolaevich; Chernov, Andrei Nikolaevich; Chizhov, Sergei Ilich; and Shevyakov, Nikolai Nikolaevich. Hard solder for high-temperature brazing of constructional materials. 3,709,682, Cl. 75-134.00c.

Bell, Alfred S.; and Churchman, Fred L. Apparatus for detecting deviation in tire pressure. 3,710,314, Cl. 340-58.000.

Bell, Berl L. Street and parking lot cleaner attachment for vehicles. 3,708,823, Cl. 15-340.000.

Bell Telephone Laboratories, Incorporated: *See—*
Ashkin, Arthur, 3,710,279.
Bobeck, Andrew Henry; and Fischer, Robert Frederick, 3,710,356.
Gibson, Walter Maxwell; and Hutson, Andrew Rhodes, 3,709,741.
Graham, Rooonald Lewis; and Pollak, Henry Otto, 3,710,026.
Laggy, William Joseph; and May, Harold Frederick, 3,710,025.

Beltz, John Prickett; and Currie, Harold Burtis, to Orbital Systems Inc. Character reader exhibiting on-the-fly recognition techniques. 3,710,322, Cl. 340-146.30j.

Bemis Company, Inc., mesne: *See—*
Folk, Dennis L.; and Pavnica, Cyril A., 3,708,951.

Bencze, William Laszlo, to Ciba-Geigy Corporation. Hypocholesterolemic phenoxy-aliphatic acid compositions. 3,709,993, Cl. 424-317.000.

Bender, Stanley O.: *See—*
Digirolamo, Joseph; and Bender, Stanley O., 3,708,877.

Bendix Corporation, The: *See—*
Howard, Donald W.; Eppley, Dewey W.; and Steininger, Hugh D., 3,710,385.
Spencer, Glenn S., 3,709,342.

Bennett, Robert A. Multi position adjustable roofing knife. 3,708,881, Cl. 30-320.000.

Bercz, Christa V.; Rozmanith, Jolan S.; and Bercz, Jeno P., to Lurex, Inc. Self illuminating chemiluminescent fishing lure. 3,708,903, Cl. 43-17.600.

Bercz, Jeno P.: *See—*
Bercz, Christa V.; Rozmanith, Jolan S.; and Bercz, Jeno P., 3,708,903.

Berg, Dennis R. CO_2 food freezing method and apparatus. 3,708,995, Cl. 62-63.000.

Bergem, Norman; Blindheim, Ulf; Onsager, Olav-Torgeir; and Wang, Hagbarth, to Sentralinstitutt for Industriell forskning. Process for dimerization, codimerization, polymerization and copolymerization of mono-olefines. 3,709,953, Cl. 260-683.15d.

Bergeron, John A.: *See—*
Niedrach, Leonard W.; and Bergeron, John A., 3,709,812.

Berkovits, Barough V., to American Optical Corporation. Free-running atrial and demand ventricular pacer. 3,709,229, Cl. 128-419.00p.

Berlyn, Martin John. Generation of hot vapour. 3,708,976, Cl. 60-39.250.

Bernardi, Luigi; Bertazzoli,Cesare; Chieli, Tecla; and Maggioni, Paola, to Societa Farmaceutici Italia. Hydroxyisoquinuclidine derivatives. 3,709,893, Cl. 260-293.540.

Berry, Thomas L., Jr., to Litho-Paint Poster Company. Mobile price-rail marker. 3,708,899, Cl. 40-128.000.

Bertazzoli,Cesare: *See—*
Bernardi, Luigi; Bertazzoli,Cesare; Chieli, Tecla; and Maggioni, Paola, 3,709,893.

Berzin, Gunard Valdemarovich: *See—*
Abramov, Viktor Petrovich; Junga, Yan Petrovich; Berzin, Gunard Valdemarovich; Skrupsky, Voldemar Petrovich; Frolov, Petr Nikolaevich; Lugovskoi, Andrei Lukyanovich; Shilgorin, Felix Alexandrovich; Dalbinsh, Yan Yanovich; Rotsen, Karl Arturovich; Ziemelis,Andris Eduardovich; Elksnis, Artur Yanovich; and Priede, Bruno Andreevich, 3,709,270.

Besson, Andre, to Societe de Traitements Electrolytiques et Electrothermiques. Vacuum tight high-frequency coaxial lead-throug capable of handling high power. 3,710,001, Cl. 174-15.0bh.

Best, Roland W.; Doughty, Raymond A.; and Vander Burgh, Leonard F., to Staley, A. E., Manufacturing Company. Bleached starch composition of improved enzyme convertibility and process for use thereof. 3,709,788, Cl. 195-31.00r.

Bethlehem Steel Corporation: *See—*
Tarhan, Mehmet Orhan, 3,709,976.

Beuk, Jack F.; and Warner, William D. Proteolytic enzyme formulation. 3,709,790, Cl. 195-66.00r.

Beyerlein, David G.: *See—*
Van Ostrom, David L.; Sweet, Douglas W.; and Beyerlein, David G., 3,709,567.

Bianchi, Angelo: *See—*
Milanese, Vincenzo; and Bianchi, Angelo, 3,709,127.

Bichell, William J.: *See—*
Wyman, Dennis G.; and Bichell, William J., 3,709,502.

Bienz, Hans, to Stoba AG. Security seal. 3,708,835, Cl. 24-16.0pb.

Bier, Gerhard: *See—*
Fuchs, Otto; Bier, Gerhard; and Trautvetter, Werner, 3,709,776.

Binder, Rolf; Grundler, Christof; and Wildbolz, Rudolf, to Rieter Machine Works, Ltd. Method and apparatus for producing an even continuous layer of fibers. 3,709,406, Cl. 222-55.000.

Binek, Heinz, to Consolidated Burris International, Ltd., mesne. Seating furniture and method of manufacturing such furniture. 3,709,560, Cl. 297-445.000.

BiO_2 Systems, Inc.: *See—*
Smart, David Ol, IV; Pennington, Grover B.; Plettner, Richard M.; and Maughan, Robert F., 3,709,363.

Birkenmaier, Wilhelm: *See—*

Simon, Hurst; and Birkenmaier, Wilhelm, 3,709,135.

Bisberg, Aaron M. Folder for overhead projector. 3,709,590, Cl. 353-120.000.

Bishop, Arlo G., to Clark Equipment Company. Dual hose reel. 3,709,252, Cl. 137-355.170.

Bishop, Hugh S., to PPG Industries, Inc. Edge-roll machine in float glass apparatus. 3,709,673, Cl. 65-182.00r.

Bishop, Milton L.: *See—*
Braunlich, Frank H., Jr.; and Bishop, Milton L., 3,709,295.

Bitney, Robert H. Method for assembling spring-biased hinge pin unit. 3,708,859, Cl. 29-430.000.

Bixby, Herbert E.: *See—*
Churchill, Charles W.; and Bixby, Herbert E., 3,709,553.

Blackstone Industries, Inc.: *See—*
Schwartzstein, Frederick, 3,709,141.

Blakeslee, Thomas R.; and Bryll, Erwin, to Calumet Photographic, Inc. Integrating light meter with movable meter mechanism. 3,709,615, Cl. 356-224.000.

Blank, Elmer D. Torroidal boring head. 3,709,624, Cl. 408-127.000.

Blaschke, Felix; and Haken, Klaus, to Siemens Aktiengesellschaft. Planar vector analyzer. 3,710,088, Cl. 235-189.000.

Blatt, James R.: *See—*
Soumerai, Henri; Hoody, Harold W., Jr.; Hamilton, Clark B.; and Blatt, James R., 3,708,959.

Blindheim, Ulf: *See—*
Bergem, Norman; Blindheim, Ulf; Onsager, Olav-Torgeir; and Wang, Hagbarth, 3,709,953.

Blinow, Igor; and Leduc, Robert D., to Polaroid Corporation. Film advancing apparatus. 3,709,122, Cl. 95-11.00r.

Blockwick, Thomas Nicholas, to Ocean Systems, Inc. System and barrier for containing an oil spill. 3,708,982, Cl. 61-1.00f.

Blonn, George W., Sr., to General Motors Corporation. Locomotive controller with throttle escapement. 3,710,055, Cl. 200-153.00r.

Blood, Alden E.: *See—*
Albers, Kenneth H.; Blood, Alden E.; and Snapp, Thomas C., Jr., 3,709,858.

Bloom, Stanley M.; and Farney, Leonard C., to Polaroid Corporation. Novel photographic products and processes utilizing multicolor additive screens whose filter units are formed of development-diffusible dyes. 3,709,693, Cl. 96-118.000.

Bloomfield, John, to Solatron Electronic Group Limited. Measurements with digital voltmeters. 3,710,248, Cl. 324-99.00d.

Bloxsom, Daniel E.: *See—*
Rhodes, Barry V.; and Bloxsom, Daniel E., 3,709,026.

Blozis, Peter P., to Paltier Corporation, The. Pallet tiering frame interlock. 3,709,165, Cl. 108-53.000.

Bobeck, Andrew Henry; and Fischer, Robert Frederick, to Bell Telephone Laboratories, Incorporated. Strip domain propagation arrangement. 3,710,356, Cl. 340-174.0tf.

Bode, Robert H.: *See—*
Sylvester, Willard G.; Boynton, Ira D.; and Bode, Robert H., 3,709,418.

Boden, Heinrich; Breer, Karl; Klessmann, Gunther; and Knipp, Ulrich, to Farbenfabriken Bayer Aktiengesellschaft. Mean for the production of moulded components from chemical components which react quickly with one another. 3,709,640, Cl. 425-4.000.

Boeing Company, The: *See—*
Watts, John F.; Lang, John M.; Simonson, Alden D.; and Nomura, Raymond S., 3,709,450.

Bogachenko, Alexey Georgievich: *See—*
Medovar, Boris Izrailevich; Popov, Viktor Andreevich; Alferov, Jury Fedorovich; Bogachenko, Alexey Georgievich; and Latash, Jury Vadimovich, 3,709,997.

Boissin, Jean, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Variable diameter pulley. 3,709,051, Cl. 74-230.17m.

Bolliger, Martin, to Prolizenz AG. Machine with horizontally or inclined disposed caterpillar mold for the downward casting of nonferrous metals. 3,709,281, Cl. 164-153.000.

Bolster, Gene A.; and Mathes, Alva F., to Eastman Kodak Company. Method and apparatus for chopping a plurality of articles and depositing the articles in complementary article receptors. 3,708,860, Cl. 29-430.000.

Bomac Manufacturing Corporation: *See—*
McMillan, Allen, 3,709,391.

Bomko, Vasily Alexeevich; Revutsky, Evgeny Ivanovich; Rudiak, Boris Ivanovich; and Pipa, Anatoly Vasilievich. Method for the acceleration of ions in linear accelerators and a linear accelerator for the realization of this method. 3,710,163, Cl. 313-63.000.

Bondarenko, Oleg Petrovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.

Boning, Horst: *See—*
Spengler, Erich; Boning, Horst; and Requardt, Heiko, 3,709,609.

Bonnemay, Maurice G.; Bronoel, Guy R.; and Doniat, Denis, to Agence Nationale de Valorisation de la Recherche. Electrochemical generator with disperse carbon electrode. 3,709,735, Cl. 136-86.00a.

Bonzack, Eugene P.: *See—*
Olds, Richard G.; and Bonzack, Eugene P., 3,710,197.

Book Covers, Inc.: *See—*
Carter, Leewood C.; Mullen, Edward K.; and Davanzo, Anthony J., 3,708,813.

Books, Arlen K.; and Froemke, James W., to International Business Machines Corporation. Synchronous communications adapter. 3,710,327, Cl. 340-172.500.

Boonstra, Willem Frederik; Meindersma, Tabe Ernst; and Van Galen, Piet. Assembly for separating a substantially dust-free part from a space. 3,708,963, Cl. 55-373.000.

Boothe, Jerry Emile: *See—*
Walker, Jerry Lee; and Boothe, Jerry Emile, 3,709,816.

Boothe, Jerry Emile; and Cornelius, Thomas Edward, III, to Calgon Corporation. Boiler water treatment. 3,709,815, Cl. 210-58.000.

Borg-Warner Corporation: *See—*
Hoeg, Donald F.; Legg, Leo V.; and Tijunelis, Donatas, 3,710,007.
Hoeg, Donald F.; Legg, Leo V.; and Tijunelis, Donatas, 3,710,009.

Borg-Warner Limited: *See—*
Ivey, John Saxon, 3,709,635.
Schumacher, Cecil W., 3,710,048.

Borgs Fabriks Aktiebolag: *See—*
Carlsson, Sixten Einar; Myhr, Lars Halvar; and Svensson, Lars-Ake Erling, 3,709,335.

Borkovitz, Henry S., to Sola Basic Industries, Inc. Polyphase saturable power modulator. 3,710,233, Cl. 323-45.00.

Borum, Otis C.: *See—*
Piker, Herbert M.; and Borum, Otis C., 3,709,178.

Bosch, Robert, G.m.b.H.: *See—*
Bachle, Karl; Finkbeiner, Ludwig; and Taubitz, Bernd, 3,710,158.
Reiff, Karl; and Muhlich, Peter, 3,708,978.
Schilling, Rainer, 3,710,154.

Bougle, Francoise, to Compagnie Generale de Radiologie. X-ray tube having a rotary anode. 3,710,162, Cl. 313-60.000.

Boultinghouse, Harold D., to Phillips Petroleum Company. Article and method of manufacture. 3,709,771, Cl. 161-67.000.

Boulton, Norman B.: *See—*
Austin, Max M.; and Boulton, Norman B., 3,709,339.

Bouman, Antonius Fredericus Mattias; Brands, Antoon Hendrikus; and Mulder, Willem, to N.V. Hollandse Signaalapparaten. System for recording and reproducing radar video signals. 3,710,380, Cl. 343-5.00r.

Boustany, Kamel; and Coran, Aubert Yaucher, to Monsanto Company. Mixed discontinuous fiber reinforced composites. 3,709,845, Cl. 260-17.4bb.

Bowden, Kenneth; Davis, Robin Alastair; Hills, Derek William; and Sach, George Sidney, to Smith Kline & French Laboratories Limited. Acetylenic carbamates. 3,709,925, Cl. 260-471.000.

Bower, John E., Jr., to United States Steel Corporation. Continuous-casting mold with thin-walled copper liner. 3,709,286, Cl. 164-208.000.

Bowers, Richard W. Log debarking apparatus. 3,709,272, Cl. 144-208.00e.

Bowers, Thomas S., to Hansen, A. L., Manufacturing Co. Cargo securing device. 3,709,156, Cl. 105-369.00a.

Bowman, Ronald R., to Motorola, Inc. Fabrication of semiconductor devices. 3,709,695, Cl. 96-36.200.

Boyce, Clive B. C.; Barker, Michael D.; and Wood, Jack, to Shell Oil Company. Phosphorylated 1,2,5-oxadiazole derivatives. 3,709,902, Cl. 260-307.00g.

Boyden, Albert C. Applicator for an internal prophylactic appliance. 3,709,220, Cl. 128-132.00r.

Boynton, Ira D.: *See—*
Sylvester, Willard G.; Boynton, Ira D.; and Bode, Robert H., 3,709,418.

BP Chemicals Limited: *See—*
Gasson, Edward James, 3,709,829.

Brands, Antoon Hendrikus: *See—*
Bouman, Antonius Fredericus Mattias; Brands, Antoon Hendrikus; and Mulder, Willem, 3,710,380.

Brandt, Robert E.; Fegeat, Tony G.; and Forde, Patrick J., to Bunker-Ramo Corporation, The. Apparatus for producing patterned deep pile circular knitted fabrics. 3,709,002, Cl. 66-9.00b.

Brant, William: *See—*
Baker, Arthur R.; Brant, William; and Danielson, Clarence J., 3,709,492.

Brasher, Leonard E. Photographic print processing apparatus. 3,709,138, Cl. 95-93.000.

Bratkowski, Walter V.: *See—*
Shoupp, William E.; and Bratkowski, Walter V., 3,709,118.

Braunlich, Frank H., Jr.; and Bishop, Milton L., to Dow Chemical Company, The. Fracturing of subterranean formations. 3,709,295, Cl. 166-245.000.

Braunschweiler, Hans Georg, to Fischer, Georg, A.G. Brugg. Circular weaving machine. 3,709,262, Cl. 139-14.000.

Bray, Ralph; and Rowan, Clement W., to Philco-Ford Corporation. Electronic switch. 3,710,143, Cl. 307-244.000.

Brean, John W., to Baldwin, D. H., Company. Optical encoder. 3,710,375, Cl. 340-347.00p.

Brebner, Donald Lee, to Du Pont de Nemours, E. I., and Company. Polyethylene blends of ethylene-methacrylic acid copolymer and polyethylene. 3,709,957, Cl. 260-897.00b.

Breer, Karl: *See—*
Boden, Heinrich; Breer, Karl; Klessmann, Gunther; and Knipp, Ulrich, 3,709,640.

Breidert, George M.: *See—*
Breidert, George M.; and MacCorkell, Albert W. (said MacCorkell assor. to said), 3,709,016.

Breidert, George M.; and MacCorkell, Albert W., said MacCorkell assor. to said Breidert, George M. Sheet metal forming machine. 3,709,016, Cl. 72-123.000.

Brennan, Timothy A.; and Green, Elmer R., to Hospital Service Technology Corporation. Closure for containers. 3,709,395, Cl. 215-38.00r.

Bress, Dellason F., to Foster Wheeler Corporation. Control of environmental pollution in tall oil fractionation. 3,709,793, Cl. 203-4.000.

Breston, Michael P. Apparatus for drying pipelines. 3,708,819, Cl. 15-104.06r.

Bretting, C. G., Manufacturing Co., Inc.: *See—*
Trogan, John F.; and Beebe, James H., 3,709,077.

Brevick, Arnold Aage, to Bunker Ramo Corporation. Push-button switch for mounting on printed circuit board. 3,710,060, Cl. 200-166.0pc.

Brewer, Donald R.; and Schipper, Richard A., to Tele Cash, Inc. Preset electronic cash register. 3,710,085, Cl. 235-164.000.

Bright, Peter Frederick; and Germany, Michael John, to Lucas, Joseph, (Industries), Limited. Headlamp assemblies. 3,710,097, Cl. 240-41.600.

Brill, Beatrice M.: *See—*
Brill, Eugene L.; and Brill, Beatrice M., 3,709,369.

Brill, Eugene L.; and Brill, Beatrice M. Power driven transfer roll for flexible oil collector tube. 3,709,369, Cl. 210-400.000.

Brill, Henry L., to E.R.E. Laboratory, Inc. Picture projector. 3,709,417, Cl. 226-76.000.

British Petroleum Company, Limited, The: *See—*
Desty, Denis Henry; and Young, Christopher John, 3,709,654.

British Railways Board: *See—*
Whitbread, John Edgar; and Attwell, Ronald Leslie, 3,709,116.

British Steel Corporation: *See—*
Calton, Ernes; and Spencer, Arthur, 3,710,068.

Broadbent, Edward Gerald, to Shellag Estates Limited. Van bodies. 3,709,552, Cl. 296-28.00m.

Brockway Glass Company, Inc.: *See—*
De Santis, Urbano J.; and Snyder, Herbert C., 3,709,672.

Brody, Norman M., to Norman Industries, Inc. Decorative light diffusing element. 3,709,766, Cl. 161-3.500.

Broido, Jacques. Bracelet-watch. 3,709,412, Cl. 224-4.00e.

Bronoel, Guy R.: *See—*
Bonnemay, Maurice G.; Bronoel, Guy R.; and Doniat, Denis, 3,709,735.

Brookside Corporation: *See—*
Wooden, John A., 3,709,633.

Brorein, William J.: *See—*
Humen, Nicholas; and Brorein, William J., 3,708,853.

Brown Boveri & Cie AG: *See—*
Althoff, F. Dankward, 3,710,190.

Brown, D. S., Company, The: *See—*
Brown, Delmont D., 3,709,115.

Brown, Delmont D., to Brown, D. S., Company, The. Pavement joint seal. 3,709,115, Cl. 94-18.000.

Brown, Kenard D. Flexible helical conveyor for liquids. 3,709,357, Cl. 198-213.000.

Brown, Peter W., to Outboard Marine Corporation. Crankcase drainings recycling system. 3,709,202, Cl. 123-73.00r.

Brown, Wallace H.: *See—*
Gauger, Edward A., Jr.; Brown, Wallace H.; and Gartner, William J., 3,709,169.

Brown, William E.; and Gilbert, Edmond E. Apparatus for confining oil spills. 3,708,983, Cl. 61-1.00f.

Browning, William C.; Chesser, Billy G.; and Wood, Jerry L., to Milchem Incorporated. Oil phase drilling fluid additive, composition and process. 3,709,819, Cl. 252-8.50p.

Bruinsma, Anne Hendrik, to U.S. Philips Corporation. Switching apparatus for selectively and sequentially operating two rows of lamps with lock-out means therebetween. 3,710,379, Cl. 340-379.000.

Brunetti, Heimo: *See—*
Dexter, Martin; Knell, Martin; and Brunetti, Heimo, 3,709,883.

Bryant, John C.: *See—*
Aurich, Christoph W.; Bryant, John C.; and Riley, James R., 3,709,248.

Bryll, Erwin: *See—*
Blakeslee, Thomas R.; and Bryll, Erwin, 3,709,615.

Brzoska, Edmund: *See—*
Kobylinski, Lech; Krezelewski, Mieczyslaw; Brzoska, Edmund; and Krenicki, Witold, 3,709,180.

Brzozowski, Stephen Joseph; and Polkinghorn, Melvin William, to International Telephone and Telegraph Corporation. Safe disconnect electric socket. 3,710,047, Cl. 200-51.100.

Buchel, Karl-Heinz: *See—*
Draber, Wilfried; Regel, Erik; Buchel, Karl-Heinz; and Plempel, Manfred, 3,709,901.

Buchwald, Robert M., to General Motors Corporation. Headlamp cleaner. 3,708,822, Cl. 15-250.030.

Buck, Daniel C., to Westinghouse Electric Corporation. Deposited latched junction circulator having magnetic flux return paths. 3,710,280, Cl. 333-1.100.

Budd Company, The: *See—*
Buyze, Edwin K., 3,709,333.

Buderus'sche Eisenwerke: *See—*
Hubert, Helmut; Jung, Anton L.; Lapczyna, Manfred; Ledwon, Erhard; Rock, Wilfried; and Schmidt-Burbach, Gerhard, 3,710,077.

Budlane, Stanley J., to General Electric Company. Burner ignition system. 3,710,192, Cl. 317-96.000.

Buelow, William H.: *See—*
Peterson, Norman L.; and Buelow, William H., 3,710,217.

Buhayar, Eric S.; Hazard, James E.; Jaagus, John J.; Werner, Fred W.; Wheeler, Robert W.; and Crowe, Robert C., to Scott Paper Company. Method and apparatus for removing objects from continuously moving mandrels. 3,709,349, Cl. 198-25.000.

Bunker Ramo Corporation: *See—*
Brevick, Arnold Aage, 3,710,060.

Bunker-Ramo Corporation, The: *See—*
Brandt, Robert E.; Fegeat, Tony G.; and Forde, Patrick J., 3,709,002.
Parks, Howard L., 3,708,874.

Burcher, Ernest E.; Rowland, Carroll W.; and Sinclair, Archibald R., to United States of America, National Aeronautics and Space Administration. Laser communication system for controlling several functions at a location remote to the laser. 3,710,122, Cl. 50-199.000.

Burcz, Lawrence D., to Ford Motor Company. Automatic transmission control circuit with electrically operated valves. 3,709,066, Cl. 74-866.000.

Burger, William H., to Kimberly-Clark Corporation. Method and apparatus cross-drafting fibrous nonwoven webs. 3,708,831, Cl. 19-236.000.

Burgess, James P.; Polkinghorn, Melvin W.; and Dieterle, Gunther, to International Telephone and Telegraph Corporation. Switches for turn signal and hazard warning lights. 3,710,049, Cl. 200-61.270.

Burke, Charles R., to Abbott Laboratories. Method for determining total blood serum iron-binding capacity. 3,709,985, Cl. 424-1.000.

Burleigh, John E., to Phillips Petroleum Company. Natural rubber masterbatches. 3,709,958, Cl. 260-754.000.

Burroughs Corporation: *See—*
Klehm, William G., Jr., 3,708,876.

Burroughs Wellcome Co.: *See—*
Smith, Sydney Edwin; O'Reilly, Kevin J.; and Prydie, John, 3,709,782.

Burrows, Edwin H. Protective wheel enclosure. 3,709,519, Cl. 280-150.00r.

Burton, Geraldine E. Gown construction. 3,708,800, Cl. 2-74.000.

Burton, Lawrence A., to Allen-Bradley Company. Conductor supporting partition for electrical control center. 3,710,198, Cl. 317-120.000.

Bush, Paul S. Shelf position-holding means. 3,709,166, Cl. 108-106.000.

Bush, Vannevar; and Smith, Joseph L., Jr., to Massachusetts Institute of Technology. Circuital flow hot gas engines. 3,708,979, Cl. 60-59.00r.

Bushrod, Charles James, to Electric Power Storage Limited. Mould for casting electorde greds for electric storage batteries. 3,709,459, Cl. 249-134.000.

Buslik, Walter S., to International Business Machines Corporation. Magnetic disk storage file in sealed enclosure. 3,710,357, Cl. 340-174.10c.

Butana Match A.G.: *See—*
Piffath, Rodney S.; and Cole, John J., 3,709,462.

Butman, Stanley: *See—*
National Aeronautics and Space Administration, 3,710,257.

Button, Aaron Russell. Mobile home pad construction. 3,708,931, Cl. 52-169.000.

Buyze, Edwin K., to Budd Company, The. Disk brake actuator and adjustment means. 3,709,333, Cl. 188-71.900.

Buzzi, Umberto: *See—*
Fiebelmann, Peter; Neu, Helmut; and Buzzi, Umberto, 3,709,781.

C & M Manufacturing Company, Inc.: *See—*
Smith, Raymond L., Jr., 3,709,331.

Cahill, Robert Francis, to International Telephone and Telegraph Corporation. Packaging for cylindrical and similar objects. 3,708,946, Cl. 53-37.000.

Cain, Wayne R.; Marcus, Konrad H.; and Prince, Edgar D., to Prince Corporation. Bone holding mechanism. 3,708,828, Cl. 17-1.000.

Caldo, Cornelio: *See—*
Cappuccio, Vittorio; Caldo, Cornelio; and Cantatore, Giuseppe, 3,709,839.

Caldwell Company, Inc., The: *See—*
Hogshead, Fred G., 3,709,548.

Caldwell, Richard L.; and Givens, Wyatt W., to Mobil Oil Corporation. Method of indirectly monitoring the output of a pulsed neutron source. 3,710,112, Cl. 250-83.30r.

Calgon Corporation: *See—*
Boothe, Jerry Emile; and Cornelius, Thomas Edward, III, 3,709,815.
Slagel, Robert Clayton; and Sinkovitz, Gloria Dimarco, 3,709,780.
Walker, Jerry Lee; and Boothe, Jerry Emile, 3,709,816.

Caligiuri, Joseph. Split tee device. 3,709,532, Cl. 287-54.00c.

Calton, Ernes; and Spencer, Arthur, to British Steel Corporation. Preheating of welding slay for better starting. 3,710,068, Cl. 219-73.000.

Calumet Photographic, Inc.: *See—*
Blakeslee, Thomas R.; and Bryll, Erwin, 3,709,615.

Camco, Incorporated: *See—*
Kilgore, Marion D., 3,709,294.

Campanella, Matthew J.: *See—*
Guillen, Francisco J.; and Campanella, Matthew J., 3,710,377.

Campbell, Gregory A., to General Motors Corporation. Forming skin covered foam by expanding a polyurethane mixture containing excess blowing agent in a closed mold. 3,709,965, Cl. 264-45.000.

Canaday, Joh L.: *See—*
McKee, James B.; and Canaday, Joh L., 3,709,524.

Canadian International Paper Company: *See—*
Gupta, Virendra N., 3,709,779.

Canon Kabushiki Kaisha: *See—*
Kawakubo, Kazuo; and Kurahashi, Akira, 3,709,592.
Kohtani, Yutaka, 3,710,036.

Cantatore, Giuseppe: *See—*
Cappuccio, Vittorio; Caldo, Cornelio; and Cantatore, Giuseppe, 3,709,839.

Cappel, Marie-Luise: *See—*
Frohlich, Alfons; Cappel, Marie-Luise; and Stubiger, Ernst, 3,708,836.

Cappuccio, Vittorio; Caldo, Cornelio; and Cantatore, Giuseppe, to Montecatini Edison S.p.A. Fiber-forming compositions having improved dye receptivity, process for their preparation and new basic nitrogen compounds employed therein. 3,709,839, Cl. 260-2.0b.

Carbonara, Carl. Silent electric switch means. 3,710,057, Cl. 200-164.00r.

Cardy, Charles Frederick: *See—*
Lee, Stephen Arthur; Cardy, Charles Frederick; and Sampson, Keith George, 3,709,981.

Carle & Montanari S.p.A.: *See—*
Consoli, Claudio, 3,709,442.

Carleton, Joseph G.; McEwen, Cassius R.; and Williams, Frederick G., Jr., said Carleton and said McEwen assors. to Beckman Instruments, Inc. Automatic fraction collector. 3,708,948, Cl. 53-74.000.

Carlson, Ronald E.; and Hart, Milburn L. Pipe insulating method and apparatus. 3,709,751, Cl. 156-78.000.

Carlsson, Sixten Einar; Myhr, Lars Halvar; and Svensson, Lars-Ake Erling, to Borgs Fabriks Aktiebolag. Energy absorber and method of operating same. 3,709,335, Cl. 188-296.000.

Carmichael, Paul D.: *See—*
Pogonowski, Ivo C.; and Carmichael, Paul D., 3,708,985.

Caron, Paul R.: *See—*
Mailloux, Robert J.; and Caron, Paul R., 3,710,329.

Carrier Corporation: *See—*
Sturley, Richard A., 3,709,757.
Wood, Russell E., 3,709,769.

Carter, Efton T.: *See—*
Edmonston, William H.; and Carter, Efton T., 3,709,469.

Carter, Leewood C.; Mullen, Edward K.; and Davanzo, Anthony J., to Book Covers, Inc. Method and apparatus for making books including a book block bonded to a book cover board structure. 3,708,813, Cl. 11-3.000.

Cartlidge, Dennis Murray: *See—*
Hach, Vladimir; Lockhart, Robert William; and Cartlidge, Dennis Murray, 3,709,943.

Cascade Corporation: *See—*
Nutter, Ralph E., 3,709,547.

Cassimally, Khalil Ahmad Ibrahim. Trolley case. 3,709,513, Cl. 280-37.000.

Cast, Adolf: *See—*
Mohr, Johannes; and Cast, Adolf, 3,709,328.

Castiglioni, Achille. Vertically and circularly displaceable support. 3,709,453, Cl. 248-328.000.

Caterpillar Tractor Company: *See—*
Eftefield, Larry G., 3,708,896.
Karstensen, Karl W.; Koch, James M.; and Hoftiezer, Wallace A., 3,709,631.
Peterson, Wayne A.; and Wirtz, Edward A., 3,709,100.
Starling, James G., 3,709,065.

Cattorini, Joseph F.: *See—*
Nelson, Carl R.; Cattorini, Joseph F.; and Terbay, Joseph J., 3,709,482.

Cegedur GP: *See—*
Laurencin, Marcel, 3,709,025.

Celanese Coatings Company: *See—*
Dalton, Jerry Owen; and Graver, Richard Byrd, 3,709,743.

Cerberus AG: *See—*
Lampart, Thomas; Scheidweiler, Andreas; and Kuhn, Max, 3,710,110.

Cerco Corporation: *See—*
Smedley, Richard W.; and Mack, Earl J., 3,709,163.

Cerniglia, Joseph Anthony, Jr. Intensity modulated teardrop display for a vectorcardiograph. 3,710,174, Cl. 315-22.000.

Cervenak, Peter J., to Nicholson Manufacturing Company. Log barker ring position controller. 3,709,269, Cl. 144-208.00e.

Ceskoslovenska Akademie ved: *See—*
Stoy, Artur, 3,709,842.

Cessna Aircraft Company: *See—*
Jones, Jack, 3,708,934.

Cettin, Edward J.; Pappas, Jimmy P.; and Lager, Sam E., to Thermo-Chem Systems, Inc. Anti-pollution system for internal combustion engines. 3,709,203, Cl. 123-119.00a.

Chacko, Joseph, to Sargent Industries, Inc., mesne. Trigger mechanism for gas valving apparatus. 3,709,044, Cl. 74-2.000.

Chae, Hi Chul: *See—*
Vandenberg, Willard J.; Chae, Hi Chul; Stewart, Elmer R.; Palmer, Wayne R.; and Padgitt, Howard R., 3,709,598.

Chafitz, Steven R.: *See—*
Hollies, Norman R. S.; and Chafitz, Steven R., 3,709,657.

Chalkley, Lyman. Precision dosimetry of high energy radiation. 3,710,109, Cl. 250-83.0cd.

Chandler, Benson. Press for a wooden truss. 3,709,762, Cl. 156-580.000.

Channell, Andrew Willis; Shikasho, Satoru; and Sommer, Gilbert Robert, to International Telephone and Telegraph Corporation. Zone control valves. 3,709,431, Cl. 236-68.00r.

Channell, William H. Connecting block and housing for use in underground residental power distribution. 3,710,003, Cl. 10/30/72.

Chapin, John S.: *See—*
Wright, Robert J.; Chapin, John S.; Mah, George; and Karstendiek, Claude A., 3,709,809.

Chapman, Thomas Henry, to Gunson's Sortex Limited. Optical unit for use in a light-sensitive sorting machine. 3,710,099, Cl. 240-51.11r.

Chase, Ascher, to General Foam Plastics Corporation. Slide-in, slide-out play pool. 3,708,807, Cl. 4-172.000.

Chase, Charles P., to Beckman Instrument, Inc. Pressure regulator. 3,709,242, Cl. 137-81.000.

Chase, Curtis A., Jr.: *See—*
Coles, Roy D., Jr.; Thomeer, Johannes H. M.; and Chase, Curtis A., Jr., 3,709,032.

Chase, David O.; Maloney, Martin V.; Wood, Frederick J., Jr.; and Wood, Barry B., to Shur-Line Manufacturing Co., Inc. Paint edger. 3,708,821, Cl. 15-210.00r.

Chelyabinsky Traktorny Zavod: *See—*
Dukhovny, Rafael Gershonovich; Magarillo, Boris Lvovich; Naidenov, Alexandr Ivanovich; Ovcharov, Bladimir Vasilievich; and Potapjik, Nikolai Nikolaevich, 3,709,103.

Chemetros Corporation: *See—*
Hardt, Robert C.; and Kozlow, Edward, 3,708,993.

Chemical Construction Corporation: *See—*
Villiers-Fisher, John F., 3,709,977.

Chemiebau Dr. A. Zieren GmbH & Co. KG: *See—*
Johswich, Friedrich; and Schindelbeck, Werner, 3,708,981.

Chernov, Andrei Nikolaevich: *See—*
Belkovsky, Viktor Alexandrovich; Grzhimalsky, Leopold Leopoldovich; Ilievsky, Irma Irmovich; Lotsmanov, Sergei Nikolaevich; Petrunin, Ivan Egorovich; Sukhov, Anatoly Vasilievich; Tikhonov, Boris Sergeevich; Levin, Boris Isaakovich; Moroz, Pavel Kirillovich Strekalov, Genrikh Nikolaevich; Chernov, Andrei Nikolaevich; Chizhov, Sergei Ilich; and Shevyakov, Nikolai Nikolaevich, 3,709,682.

Cherry, James R.; Crow, Joseph W.; and Parker, Robert H., to Ford Motor Company. Automatic headway control system. 3,710,383, Cl. 343-7.0ed.

Chesser, Billy G.: *See—*
Browning, William C.; Chesser, Billy G.; and Wood, Jerry L., 3,709,819.

Chesterton, Stanley Keith, Jr.; and Samph, William J., to Ametek, Inc. Dynamometer indicator system. 3,710,250, Cl. 324-115.000.

Chevron Research Company: *See—*
Jaffe, Joseph, 3,709,814.

Chiba, Yoshio, to Kanebo, Ltd. Fabric fastener. 3,708,837, Cl. 24-204.000.

Chicago Bridge & Iron Company: *See—*
Van Gelder, Louis Ralph, 3,709,170.

Chieli, Tecla: *See—*
Bernardi, Luigi; Bertazzoli,Cesare; Chieli, Tecla; and Maggioni, Paola, 3,709,893.

Chirash, William; and Zmoda, Barney Joseph, to Colgate-Palmolive Company. Cleaning composition. 3,709,825, Cl. 252-158.000.

Chisholm, Raymond S., to PPG Industries, Inc. Precipitation of siliceous pigment. 3,709,980, Cl. 423-339.000.

Chizhov, Sergei Ilich: *See—*
Belkovsky, Viktor Alexandrovich; Grzhimalsky, Leopold Leopoldovich; Ilievsky, Irma Irmovich; Lotsmanov, Sergei Nikolaevich; Petrunin, Ivan Egorovich; Sukhov, Anatoly Vasilievich; Tikhonov, Boris Sergeevich; Levin, Boris Isaakovich; Moroz, Pavel Kirillovich Strekalov, Genrikh Nikolaevich; Chernov, Andrei Nikolaevich; Chizhov, Sergei Ilich; and Shevyakov, Nikolai Nikolaevich, 3,709,682.

Christ, Karl, to Goetzewerke Friedrich Goetze A.G. Apparatus for measuring shaft sealing rings having an annular sealing lip. 3,708,885, Cl. 33-174.00l.

Christensen Diamond Products Company: *See—*
Rowley, David S.; and Ward, Charles E., 3,709,308.

Christensen, Henry Marinus. Method of preparing dextran and dextran compounds soluble in cold water. 3,709,875, Cl. 260-209.00d.

Christopher, Charles A., Jr.; Grimm, Henry J.; and Nute, Alton J., to Texaco Inc. Petroleum recovery process. 3,709,297, Cl. 166-73.000.

Christopher, William H., Jr.; Meyers, Charles O.; and Whipple, Jack C., Jr., to Process Technologists International; division of Trinity, Inc. Heater-treater. 3,708,960, Cl. 55-169.000.

Chu, Pochen, to Mobil Oil Corporation. Crystalline zeolite ZSM-11. 3,709,979, Cl. 423-328.000.

Church, Ralph E., to General Electric Company. Apparatus for forming an insulating member in situ on a laminated magnetic core. 3,709,457, Cl. 249-91.000.

Churchill, Charles W.; and Bixby, Herbert E. Golf car rain coat. 3,709,553, Cl. 296-28.00c.

Churchman, Fred L.: *See—*
Bell, Alfred S.; and Churchman, Fred L., 3,710,314.

Ciba-Geigy AG: *See—*
Koller, Stefan, 3,709,872.
Trefzer, Robert, 3,709,471.

Ciba-Geigy Corporation: *See—*
Bencze, William Laszlo, 3,709,993.
Dexter, Martin; Knell, Martin; and Brunetti, Heimo, 3,709,883.
Dexter, Martin; and Steinberg, David Herbert, 3,709,884.
Habicht, Ernst; Libis, Bernard; and Zergenyi, Janos, 3,709,909.

Cignoni, Edward P., Jr., to Raytheon Company. Interchassis cable carrier. 3,710,199, Cl. 317-122.000.

Cimadevilla, Armand: *See—*
Roulet, Jean; and Cimadevilla, Armand, 3,708,986.
Roulet, Jean; and Cimadevilla, Armand, 3,708,987.

Cimera, Richard F.: *See—*
Kaupick, Walter J.; and Cimera, Richard F., 3,709,045.

Cincinnati Milacron Chemicals Inc.: *See—*
Stapfer, Christian H., 3,709,918.

Cincinnati Milacron Inc.: *See—*
Granger, Richard J., 3,709,050.

Cincinnati Milacron-Heald Corporation: *See—*
Wake, John A., 3,709,621.

Ciotti, Antonio Pasquale, to Auto Anti-Pollution Devices of Canada Limited. High pressure valves. 3,709,255, Cl. 137-614.190.

Citizen Watch Company Limited: *See—*
Iwasawa, Hiroshi, 3,709,324.

Ciuffini, Anthony J.; and Galen, Joseph J., to Xerox Corporation. Infrared sensitive image retention photoreceptor. 3,709,683, Cl. 96-1.00r.

Civardi, Frank Peter: *See—*
Loew, Frederic Christian; Stone, Edward; and Civardi, Frank Peter, 3,709,864.

Claes, Frans Henri: *See—*
Florens, Raymond Leopold; Claes, Frans Henri; and Moisar, Erik, 3,709,689.

Clampitt, John Aaron: *See—*
Petrie, James Alexander; Gardiner, Terence Edward Gouvenot; and Clampitt, John Aaron, 3,709,637.

Clark Equipment Company: *See—*
Bishop, Arlo G., 3,709,252.

Clark, Ernest E., to Phillips Petroleum Company. Underwater drilling and production vessel. 3,709,307, Cl. 175-8.000.

Clark, Hal J.: *See—*
Wells, Victor S.; and Clark, Hal J., 3,709,330.

Clark, Marvin A. Solderless electrical outlet assembly for service cord. 3,710,305, Cl. 339-97.00r.

Clay, Joe D.; and Keever, Joseph M., to Westinghouse Electric Corporation. Induction meter having power-factor-adjuster. 3,710,245, Cl. 324-138.000.

Claydon, Gyongyver: *See—*
Ryley, Derek Vernon; and Claydon, Gyongyver, 3,710,018.

Clear Pack Company: *See—*
Barnhart, Charles Calvin, 3,709,647.

Clearman, Jack F.; Ohlsson, Leonard W.; and Mackin, Michael H., to Shirlpool Corporation. Method of making ice in a combined auger and press. 3,708,992, Cl. 62-71.000.

Clemens, Anton Hubert, to Miles Laboratories, Inc. Apparatus for measuring reflected light. 3,709,612, Cl. 356-178.000.

Coby, Arnold, to Lee, Raymond, Organization, Inc., The. Chance operated peg element projecting device. 3,709,500, Cl. 273-138.00a.

Coe, Charles David, to Land Pyromters Limited. Lances for taking samples of molten metal. 3,709,040, Cl. 73-54.000.

Coe, William A. Adaptor device for trailer dolly wheels and pad. 3,709,534, Cl. 287-119.000.

Cofoid, Robert D.: *See—*
Preiser, Ralph H.; Goodwin, Clarence J.; and Cofoid, Robert D., 3,709,039.

Cogliati, Guido; Recrosio, Agostino; and Lanz, Renato, to Conitato Nazionale per l'Energia Nucleare. Process for producing dense particles of plutonium compounds usable as fuels for nuclear reactors. 3,709,963, Cl. 264-.500.

Cohen, Hyman L.; King, James R., Jr.; and Minsk, Louis M., to Eastman Kodak Company. Novel polymers and photographic elements containing same. 3,709,690, Cl. 96-67.000.

Cohen, John B.; Janson, Paul E.; Mc Farland, Harold L., Jr.; and Young, James B., Jr., to Digital Equipment Corporation. Data processing system. 3,710,324, Cl. 340-172.500.

Cohen, Mitchell S.: *See—*
Smith, Donald O.; Harte, Kenneth J.; Cohen, Mitchell S.; Newberry, Sterling P.; and Speliotis, Dennis E., 3,710,352.

Cohen, Seymour. Extrusions for carrying ceiling tiles and window curtains, shades, and the like. 3,708,927, Cl. 52-39.000.

Cohen, Stanley I.: *See—*
Zocco, Natale C.; and Cohen, Stanley I., 3,709,843.

Cole, Clyde C. Weapon loader. 3,709,380, Cl. 214-1.00d.

Cole, Hayward C.; deceased (by Cole, L'Vina; executrix). Collapsible cargo container. 3,709,396, Cl. 220-1.500.

Cole, Jarold B., to Harry Lime Industries, mesne. Shocking device. 3,708,907, Cl. 43-112.000.

Cole, John J.: *See—*
Piffath, Rodney S.; and Cole, John J., 3,709,462.

Cole, L'Vina: *See—*
Cole, Hayward C., 3,709,396.

Coleman, Fred K., to Ameron, Inc. Tunnel liner jacking system and method. 3,708,984, Cl. 61-43.000.

Coles, Roy D., Jr.; Thomeer, Johannes H. M.; and Chase, Curtis A., Jr., to Shell Oil Company. Temperature pulsed injectivity profiling. 3,709,032, Cl. 73-154.000.

Colgate-Palmolive Company: *See—*
Chirash, William; and Zmoda, Barney Joseph, 3,709,825.
Inamorato, Jack Thomas, 3,709,836.

Collins, Dean E., to Root-Lowell Manufacturing Co. Seal means for a compressed gas spraying device. 3,709,409, Cl. 222-402.000.

Collins Radio Company: *See—*
Frymoyer, Edward M.; and Johnson, Robert A., 3,710,344.
Hagge, John K.; and Johnson, Frederick W., 3,710,251.

Collura, Lawrence: *See—*
Collura, Lawrence, 3,710,111.

Collura, Lawrence, to Dreyfus, Edward and Collura, Lawrence. Dynamically calibrated oil content meter. 3,710,111, Cl. 250-83.3uv.

Colombot, Pierre. Variable speed endless conveyor. 3,709,150, Cl. 104-25.000.

Colorado Instruments, Inc.: *See—*
Webb, James R.; and Webb, Richard C., 3,710,209.

Colsen, Frank Thomas; Kaufman, Peter; and Townsend, Robert L., to Educated Vehicle Systems, Inc. Auto alarm system. 3,710,317, Cl. 340-64.000.

Coltrinari, Enzo L.: *See—*
Holmes, W. Church; and Coltrinari, Enzo L., 3,709,680.

Comer, George W. Retainer for mounting truck tires. 3,709,278, Cl. 157-1.000.

Comerio, Ercole, to Metalmeccanica S.p.A. Automatic embroidery machine. 3,709,172, Cl. 112-84.000.

Commissariat a l'Energie Atomique: *See—*
Eymery, Rene, 3,710,119.

Compagnie Generale de Radiologie: *See—*
Bougle, Francoise, 3,710,162.
Loucheur, Rene; Hommerin, Michel; and Louche, Jean Claude Paul, 3,710,106.

Compagnie Generale des Etablissements Michelin, raison Sociale Michelin & Cie: *See—*
Montagne, Jean Bernard, 3,709,276.
Montagne, Jean Bernard, 3,709,277.

Compagnie Industrielle des Telecommunications: *See—*
Yapoudjian, Claude; and Henelle, Max, 3,708,812.

Computer Image Corporation: *See—*
Altemus, William C.; and Duca, James, 3,710,011.

Conder International Limited: *See—*
Bailey, Malcolm; and Downer, John Colin, 3,708,932.

Conitato Nazionale per l'Energia Nucleare: *See—*
Cogliati, Guido; Recrosio, Agostino; and Lanz, Renato, 3,709,963.

Conrad Kern AG: *See—*
Gaspers, Gunter, 3,708,928.

Consoli, Claudio, to Carle & Montanari S.p.A. Ball mill for the refining of cocoa, chocolate, paints, lacquers, enamels and the like. 3,709,442, Cl. 241-65.000.

Consolidated Burris International, Ltd., mesne: *See—*
Binek, Heinz, 3,709,560.

Constable, Geoffrey Ernest Patrick; and Holter, Godfrey George, to Smiths Industries Limited. Electronic combination lock. 3,710,136, Cl. 307-109.000.

Construction Techniques, Inc.: *See—*
Rehmar, Solomon Jacob, 3,709,707.

Continental Can Company, Inc.: *See—*
Aschberger, Anton A., 3,708,845.

Continental Engineering: *See—*
Kingma, Wouter G., 3,709,731.

Continental Oil Company: *See—*
Gordon, Ronnie D.; and Starks, Charles M., 3,709,949.

Contraves Italiana S.p.A.: *See—*
Rascioni, Vinicio; and Gianini, Giovanni, 3,709,617.

Cook, Harvey A., to TRW Inc. Low emission internal combustion engine and method of improving combustion. 3,709,201, Cl. 123-64.000.

Cook, Robert M.; and Goldman, Charles B., to ACF Industries, Incorporated. Railway car center bearing. 3,709,151, Cl. 105-199.00c.

Cooke, Geoffrey Cyril; and Gamble, John Anthony, to W & T Avery Limited. Load indicating apparatus with hysteresis correction. 3,709,310, Cl. 177-168.00.

Cooke, George A.; and Houlihan, William J., to Sandoz-Wander, Inc. 1-Substituted-5,6-dihydro-7h-pyrido(3,2,1-ij) quinazolin-3 (3h)-ones and their preparation. 3,709,887, Cl. 260-251.00a.

Cooper, James Joseph, Jr., to International Telephone and Telegraph Corporation. Electrical connector. 3,710,307, Cl. 339-116.00c.

Coran, Aubert Yaucher: *See—*
Boustany, Kamel; and Coran, Aubert Yaucher, 3,709,845.

Corman, James C.: *See—*
Staub, Fred W.; Corman, James C.; and Walmet, Gunnar E., 3,710,295.

Cornelius, Thomas Edward, III: *See—*
Boothe, Jerry Emile; and Cornelius, Thomas Edward, III, 3,709,815.

Cornelius, Victor Wayland. Indicating device. 3,708,898, Cl. 40-70.000.

Corrigan, Donald A.; Servi, Italo S.; and Wang, Chih-Chung, to Kennecott Copper Corporation. Process for accreting molten copper on a moving core member. 3,709,722, Cl. 117-114.00r.

Cossor, A. C., Limited: *See—*
Allen, Alaric, 3,710,382.

Costley, Vivian G.; and Wolf, Sylvan, to United States of America, Navy. Drill mine. 3,709,148, Cl. 102-10.000.

Cotton, Curran D., to Maytag Company, The. Dryer control. 3,710,138, Cl. 307-118.000.

Cotton, Incorporated: *See—*
Hollies, Norman R. S.; and Chafitz, Steven R., 3,709,657.

Cotton Producers Institute: *See—*
Liggett, Robert W., 3,709,716.

Cottrell, George B., to North American Rockwell Corporation. Resolver position control system. 3,710,223, Cl. 318-661.000.

Coulson, Dale M. Solvent extraction apparatus. 3,709,665, Cl. 23-269.000.

Coulter Electronics, Inc.: *See—*
Doty, Edward Neal; and Hogg, Walter R., 3,710,263.
Doty, Edward Neal; and Hogg, Walter R., 3,710,264.

Coupar, Robert B. Ground marker device. 3,709,188, Cl. 116-114.00r.

Cox, David A.: *See—*
Leeming, Peter R.; Cross, Peter E.; Cox, David A.; and Augstein, Joachim, 3,709,892.

Coyne, William E.: *See—*
Cusic, John W.; and Coyne, William E., 3,709,947.

Cozzoli Machine Company: *See—*
Green, George D.; and Weiner, Jerold S., 3,708,947.

Cracknell, Alan George: *See—*
Rutherford, Frank; Arenson, Ivor Gerald; Cracknell, Alan George; Foulds, William Henry; and Derrick, Albert, 3,709,577.

Craft, David J., to International Business Machines Corporation. Connect modules. 3,710,348, Cl. 340-112.500.

Craig Systems Corporation: *See—*
Mautner, Steven E., 3,709,733.

Crain, Donald L.: *See—*
Harrison, Roy C.; and Crain, Donald L., 3,709,850.

Cralle, Walter O., Jr.; and Lennon, Kenneth A., to International Business Machines Corporation. Copy machine with predetermined counter. 3,710,079, Cl. 235-91.00r.

Crandall Dry Dock Engineers, Inc.: *See—*
Crandall, Paul S., 3,709,177.

Crandall, Paul S., to Crandall Dry Dock Engineers, Inc. Dry dock pontoon providing improved stability. 3,709,177, Cl. 114-46.000.

Crane, Michael, to General Pneumatics Corporation. Gas generator and cartridge therefor. 3,708,994, Cl. 62-50.000.

Crapuchettes, Paul Wythe, to Litton Systems, Inc. Magnetron power supply having in-rush current limiter. 3,710,065, Cl. 219-10.550.

Crawley, Harry Donald, to Allied Farm Equipment (Manitoba), Ltd. Vertical bale elevator. 3,709,356, Cl. 198-162.000.

Crescentini, Lamberto: *See—*
Lofquist, Robert Alden; Crescentini, Lamberto; and Wincklhofer, Charles, 3,709,865.

Croisant, John A.; and Folts, Harold D., to Dow Chemical Company, The. Bearing holder. 3,709,571, Cl. 308-27.000.

Crom, Carol L., to E-System, Inc., mesne. Interferometer direction finder antenna compensation. 3,710,333, Cl. 343-114.000.

Cromie, Harry W., to Baxter Laboratories, Inc. Multiple piece clamp for connecting tubing. 3,709,526, Cl. 285-73.000.

Cronkhite, Paul W.; Voege, Robert D.; and Poletti, Joseph W., to Monsanto Company. Apparatus and process for polishing semiconductor or similar materials. 3,708,921, Cl. 51-131.000.

Crooke, Robert Curtis, to Global Marine Inc. Deep water drill pipe controlled manipulator. 3,708,990, Cl. 61-69.00r.

Crosfield Business Machines Limited: *See—*
Gray, Colin, 3,709,146.

Cross, Donald John; Eckenbrecht, Robert Roy; Price, Arthur Burke; and Scott, Benton boyd, to Sylvania Electric Products Inc. Color image display system. 3,710,012, Cl. 178-5.200.

Cross, Peter E.: *See—*
Leeming, Peter R.; Cross, Peter E.; Cox, David A.; and Augstein, Joachim, 3,709,892.

Crossley, Guy A.; and Heckert, David C., to Procter & Gamble Company, The. Preparation of acid-amide mixtures useful as solvents. 3,709,831, Cl. 252-364.000.

Crounse, Nathan N.: *See—*
Jefferies, Patrick J.; and Crounse, Nathan N., 3,709,903.

Crouzet: *See—*
Jullien-Davin, Jean, 3,710,155.

Crow, Joseph W.: *See—*
Cherry, James R.; Crow, Joseph W.; and Parker, Robert H., 3,710,383.

Crowe, Robert C.: *See—*
Buhayar, Eric S.; Hazard, James E.; Jaagus, John J.; Werner, Fred W.; Wheeler, Robert W.; and Crowe, Robert C., 3,709,349.

Crown Molding Co., mesne: *See—*
Gaul, Daniel R., 3,709,475.

Crown Zellerbach Corporation: *See—*
Anderson, Nils T., 3,709,728.

Cruse, Lee H., to Foster Manufacturing Co., Inc. Hose coupling. 3,709,528, Cl. 285-316.000.

CTS Corporation: *See—*
Digirolamo, Joseph; and Bender, Stanley O., 3,708,877.
Sawyer, Roderick V., 3,710,008.

Cuckson, Eric Engel, to Rondo Building Services Pty., Limited. Adjustable suspension systems in ceilings. 3,708,941, Cl. 52-484.000.

Culberson, Donald L., to Jaromir Tobias Rhinebeck. Radial piston hydraulic pump or motor with low loss reaction linkage. 3,709,104, Cl. 91-495.000.

Cunningham, Ernest R., to Barr-Stalfort Company. Aerosol valve with differential flow control rate. 3,709,410, Cl. 222-402.160.

Curington, Alfred R., to Baker Oil Tools, Inc. Threaded connector for impact devices. 3,709,306, Cl. 173-132.000.

Currie, Harold Burtis: *See—*
Beltz, John Prickett; and Currie, Harold Burtis, 3,710,322.

Cusic, John W.; and Coyne, William E., to Searle, G. D., & Co. 6-Chloropropy lidene-1,1a,6, 10b-tetrahydrodibenzo-(a,e) cyclopropa(c) cycloheptenes. 3,709,947, Cl. 260-649.000.

Cutler-Hammer, Inc.: *See—*
Hansen, James E., 3,710,213.
Koenig, Martin F.; De Backer, Frank A.; and Issa, Manuel, 3,710,300.

Cutter Laboratories, Inc.: *See—*
Edwards, William Sterling; Kahn, Paul; and Goodenough, Samuel H., 3,709,175.

Cyprus Mines Corporation: *See—*
Rundell, James R., 3,709,143.

Czaplinski, Thomas V.; and Haney, Thomas A., to Squibb, E. R., & Sons, Inc. Disposable pharmaceutical sterile closures. 3,709,365, Cl. 210-233.000.

Daenen, Robert, to Dart Industries, Inc. Butter container or the like. 3,709,397, Cl. 220-42.00a.

Dahlberg, John R.; Oravitz, James L., Jr.; and Michalik, Edmund R., to PPG Industries, Inc. Directional control for thermal severing of glass. 3,709,414, Cl. 225-2.000.

Daimler-Benz Aktiengesellschaft: *See—*
Kuhn, Hans-Ulrich, 3,710,364.
Reisacher, Josef, 3,709,200.
Scherenberg, Hans O., 3,710,315.
Worner, Otto, 3,708,846.

Dalbinsh, Yan Yanovich: *See—*
Abramov, Viktor Petrovich; Junga, Yan Petrovich; Berzin, Gunard Valdemarovich; Skrupsky, Voldemar Petrovich; Frolov, Petr Nikolaevich; Lugovskoi, Andrei Lukyanovich; Shilgorin, Felix Alexandrovich; Dalbinsh, Yan Yanovich; Rotsen, Karl Arturovich; Ziemelis,Andris Eduardovich; Elksnis, Artur Yanovich; and Priede, Bruno Andreevich, 3,709,270.

Dalton, Jerry Owen; and Graver, Richard Byrd, to Celanese Coatings Company. Acidic deposition process. 3,709,743, Cl. 148-6.200.

Dana, Eugene K. Vending machine. 3,709,404, Cl. 221-120.000.

Dango & Dienenthal Kommanditgesellschaft: *See—*
Baumer, Albrecht; and Schubler, Karl-Heinz, 3,709,477.

Daniels, John F., to Sperry Rand Corporation. Display stand for rechargeable battery operated. 3,710,224, Cl. 320-2.000.

Daniels, Robert S.: *See—*
Foster, Norman B.; Yeomans, Robert P.; and Daniels, Robert S., 3,708,902.

Danielson, Clarence J.: *See—*
Baker, Arthur R.; Brant, William; and Danielson, Clarence J., 3,709,492.

Dantro, Horace F., to NL Industries, Inc. Photoreactive titanium dioxide material. 3,709,984, Cl. 423-610.000.

Dao, Tich T., to Ampex Corporation. Digital variable quadrature sine wave voltage controlled oscillator. 3,710,276, Cl. 331-45.000.

Darboven, Ernest F.; and Solomon, Leon R., to Singer Company, The. Time-shared frequency tracking loop. 3,710,386, Cl. 343-9.000.

Darling, Alan Sidney: *See—*
Selman, Gordon Leslie; and Darling, Alan Sidney, 3,709,667.

Dart Industries, Inc.: *See—*
Daenen, Robert, 3,709,397.

Dartois, Jean-Pierre Andre, to International Standard Electric Corporation. Network interstage grading arrangement. 3,710,030, Cl. 179-18.0ag.

Dater, Arnold H.: *See—*
Mausner, Marvin L.; and Dater, Arnold H., 3,709,838.

Davanzo, Anthony J.: *See—*
Carter, Leewood C.; Mullen, Edward K.; and Davanzo, Anthony J., 3,708,813.

Davey, Anthony Walter, to Morris, Herbert, Limited. Apparatus for operating swing doors. 3,708,915, Cl. 49-340.000.

David, Melvin J. Display apparatus for banded merchandise. 3,709,374, Cl. 211-163.000.

Davis, Billy W., to Schlumberger Technology Corporation. Marine streamer cable. 3,710,006, Cl. 174/101,500.

Davis, Edward E. Method of preparing crispy food items. 3,709,698, Cl. 99-107.000.

Davis, Ernest E.: *See—*
Peterson, Edward C.; and Davis, Ernest E., 3,709,346.

Davis, Lewis E.: *See—*
Glomski, Ronald L.; Davis, Lewis E.; and Grover, Joseph A., 3,709,876.

Davis, Marvin A. Gun butt locator. 3,708,801, Cl. 2-94.000.

Davis, Robert Edgar: *See—*

Johnson, Harry Joseph; Wolfelsperger, Robert O.; and Davis, Robert Edgar, 3,709,114.

Davis, Robin Alastair: *See—*
Bowden, Kenneth; Davis, Robin Alastair; Hills, Derek William; and Sach, George Sidney, 3,709,925.

Davis, Walter L., to Ibex; division of Jelco. Tug vehicle with rear corner window. 3,709,521, Cl. 280-421.000.

Davoine, Georges, to Les Fabriques d'Assortiments Reunies. Flat pin pallet. 3,708,975, Cl. 58-121.00r.

Days-Ease Home Products Corporation: *See—*
Levey, John S., 3,708,908.

De Backer, Frank A.: *See—*
Koenig, Martin F.; De Backer, Frank A.; and Issa, Manuel, 3,710,300.

De Bardeleben, John F., Jr., to Morris, Philip, Incorporated. Dinitrimines. 3,709,941, Cl. 260-566.00r.

De Biasse, Richard L.: *See—*
De Biasse, Richard L.; and Harvey, Warren L. (said Harvey assor. to said), 3,709,561.

De Biasse, Richard L.; and Harvey, Warren L., said Harvey assor. to said De Biasse, Richard L. Brake and wheel assembly for motorcycles and the like. 3,709,561, Cl. 301-6.00e.

De Cepoli, Carmen; and De Cepoli, Edward C. Surface game disc element. 3,709,496, Cl. 273-128.0cs.

De Cepoli, Edward C.: *See—*
De Cepoli, Carmen; and De Cepoli, Edward C., 3,709,496.

De Fries, Jan Richard Peter; and Tresch, Erwin Josef. Flow level sensing system with flow electrical transducer, and its application. 3,709,035, Cl. 73-204.000.

De Geest, Wilfried Florent; Verkinderen, Paul August; and De Smedt, Felix Frederik, to Gevaert-Agfa N.V. Process for producing polymeric film. 3,709,964, Cl. 264-22.000.

de Groot, Cornelis Nicolaas; Hobbs, John S.; and Tonsbeek, Christiaan Herman Theodoor, to Lever Brothers Company. Furanone meat flavor compositions. 3,709,697, Cl. 99-107.000.

de Kramer, Don: *See—*
Oldershaw, C. G. Peter; and de Kramer, Don, 3,709,351.

De La Graviere, Marcel: *See—*
Helary, Jean-Louis; De La Graviere, Marcel; and Gallay, Jean-Jacques, 3,709,678.

De Priest, Thomas Y.: *See—*
Whiteside, Grady O.; and De Priest, Thomas Y., 3,708,855.

De Santis, Michael J.: *See—*
Galowin, Lawrence S.; De Santis, Michael J.; and Miller, Cary, 3,709,041.

De Santis, Urbano J.; and Snyder, Herbert C., to Brockway Glass Company, Inc. Method and apparatus for fluorine surface treatment of glass articles. 3,709,672, Cl. 65-30.000.

De Smedt, Felix Frederik: *See—*
De Geest, Wilfried Florent; Verkinderen, Paul August; and De Smedt, Felix Frederik, 3,709,964.

De Vries, James H., to Sarns, Inc. Method and apparatus for automatic pertitioneal dialysis. 3,709,222, Cl. 128-213.000.

De Winter, Frank G. V.: *See—*
Estes, Timothy K.; De Winter, Frank G. V.; Doss, John L.; and Higgins, James J., 3,708,929.

De Witt, David, to International Business Machines Corporation. Double epitaxial method of fabricating a pedestal transistor. 3,709,746, Cl. 148-175.000.

Decca Limited: *See—*
Pace, Brian, 3,710,334.

Deep Oil Technology, Inc.: *See—*
Horton, Edward E., 3,709,182.

Degnan, William J.; and Samsel, Richard W., to United States of America, Navy. Angular alignment error measuring system. 3,709,608, Cl. 356-152.000.

Deguchi, Yutaka; Kashihara, Hideo; Koozuki, Rikuzo; Takahashi, Kazuyoshi; and Ikeda, Mitsuyuki, to Sanyo Electric Co., Ltd. Vacuum cleaner. 3,708,962, Cl. 55-300.000.

Dehoff, Ronald L., to Vanderbilt, R. T., Company, Inc. Curing agent for epoxy resin comprising a cyclic anhvdride treated with an amino alcohol. 3,709,840, Cl. 260-2.0ec.

Deitemeyer, Stanley A.: *See—*
Williams, Roger B., Jr.; Loshbough, Richard C.; and Deitemeyer, Stanley A., 3,709,309.

Del Castillo, Juan M. Teaching device for attachment to a keyboard instrument. 3,709,085, Cl. 84-166.000.

Delta Electronics Inc.: *See—*
Wright, Charles S., 3,710,260.

Delta Engineering Corporation: *See—*
Klapes, Michael C.; and Macrae, Herbert N., 3,709,385.

Dembinski, Krzysztof: *See—*
Anthony, Anne-Marie, nee Barbier; Faucher, Michele, nee Dufre; and Dembinski, Krzysztof, 3,709,998.

Dennison Manufacturing Company: *See—*
Wochner, Fred Joseph, 3,709,755.

Dentsply International Inc.: *See—*
Waller, Duncan E., 3,709,866.

Deptuch, Kazimierz J., to GTE Automatic Electric Laboratories Incorporate. Bipolar read-out circuit for nondestructive magnetic memory. 3,710,354, Cl. 340-174.0tf.

Derighetti, Renato: *See—*
Ullmann, Werner; Derighetti, Renato; Tadini, Constantino; Farinelli, Roberto; and Mattei, Silvano, 3,710,067.

Derrick, Albert: *See—*
Rutherford, Frank; Arenson, Ivor Gerald; Cracknell, Alan George; Foulds, William Henry; and Derrick, Albert, 3,709,577.

Deschamps, Andre; Franckowiak, Sigismond; Gatellier, Claude; Gltkmans, Georges; and Renault, Philippe, to Institut Francais des Petrole, des Carburants et Lubrifiants. Hydrocarbon fermentation. 3,709,784, Cl. 195-28.00r.

Desgrandchamps, Guy; Hemmer, Henri; and Haurie, Michel, to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine. Dimerization of olefines. 3,709,952, Cl. 260-683.15d.

Deshetler, Louis K.: *See—*
Peisner, Israel D.; Deshetler, Louis K.; and Augustine, Paul C., 3,709,154.

Desty, Denis Henry; and Young, Christopher John, to British Petroleum Company, Limited, The. Burner. 3,709,654, Cl. 431-284.000.

Detjen, Edgar W.: *See—*
Enters, Edward W.; Detjen, Edgar W.; and Rubin, Robert M., 3,708,968.

Devlin, William A. Modular satellite. 3,709,447, Cl. 244-1.0ss.

Dewey, C Forbes, Jr., to Xenon Corporation. Light pumped laser. 3,710,277, Cl. 331-94.500.

Dexter, Martin; Knell, Martin; and Brunetti, Heimo, to Ciba-Geigy Corporation. Sulfur containing derivatives of dialkyl-4-hydroxyphenyltriazine. 3,709,883, Cl. 260-248.0cs.

Dexter, Martin; and Steinberg, David Herbert, to Ciba-Geigy Corporation. 3,5-Dialkyl-4-hydroxyphenyl alkanoic acid ester of 2,4,6-tris (alkanolamino) derivatives of triazine. 3,709,884, Cl. 260-249.600.

Diaz, Raul Ralph. Protection device for the operating member of a fire hydrant. 3,709,249, Cl. 137-296.000.

Dickey, Joyce Prince. Loom. 3,708,839, Cl. 28-15.000.

Dickstein, Samuel P.: *See—*
Miller, Robert Pincus; Badian, Abraham; and Dickstein, Samuel P., 3,710,319.

Diepeveen, John C. Wire bonding means. 3,709,422, Cl. 228-13.000.

Diesel Kiki Kabushiki Kaisha: *See—*
Suzuki, Shoichi, 3,709,001.

Dieterle, Gunther: *See—*
Burgess, James P.; Polkinghorn, Melvin W.; and Dieterle, Gunther, 3,710,049.

Digirolamo, Joseph; and Bender, Stanley O., to CTS Corporation. Method of anchoring and connecting lead wires to an electrical component. 3,708,877, Cl. 29-628.000.

Digital Equipment Corporation: *See—*
Cohen, John B.; Janson, Paul E.; Mc Farland, Harold L., Jr.; and Young, James B., Jr., 3,710,324.

Dineen Enterprises, Inc.: *See—*
Dineen, William R., 3,710,241.

Dineen, William R., to Dineen Enterprises, Inc. Apparatus for detecting faults in extruded insulating or dielectric material. 3,710,241, Cl. 324-54.000.

Disney, Walt, Productions: *See—*
James, Jack C., 3,709,313.

Ditzer, Reiner; and Nickel, Horst, to Farbenfabriken Bayer Aktiengesellschaft. Phenyl-azo-naphthyl dyestuffs. 3,709,871, Cl. 260-199.000.

Diversey Corporation, The: *See—*
Griparis, Andrew Geo., 3,709,463.

Doble Engineering Company: *See—*
Povey, Edmund H., 3,710,242.

Dobler, Johann; Hausner, Leopold; Kolbe, Andreas; and Tittus, Hans, to Farbwerke Hoechst Aktiengesellschaft. Apparatus for manufacturing foils of rigid thermoplastic material. 3,709,649, Cl. 425-363.000.

Dobson Park Industries Limited: *See—*
Ward, Richard, 3,710,177.

Doe, Walter P., to Quaker Oats Company, The. Bouncing passenger vehicle toy. 3,708,912, Cl. 46-204.000.

Doering, A. L., Mfg.: *See—*
Springman, Arthur, 3,709,167.

Doerman, Eryk Stefan, to Molins Limited. Cigarette inspection systems. 3,709,028, Cl. 73-38.000.

Doerr Electric Corporation: *See—*
Dries, James P., 3,710,294.

Dohany, Julius Eugene; and Grigger, John Casimer, to Pennwalt Corporation. Process for polymerizing fluoroolefins. 3,709,856, Cl. 260-87.700.

Doherty, Norman R. Electrically actuated punch press. 3,709,083, Cl. 83-575.000.

Doherty, William P.: *See—*
Karzbinos, Joseph V.; Leopold, Karl M.; and Doherty, William P., 3,709,867.

Doll, Claude S.: *See—*
Sturm, Walter V.; and Doll, Claude S., 3,709,377.

Dolphin, James M. Setup support. 3,709,479, Cl. 269-309.000.

Domain Industries: *See—*
Klevgard, Glenn A., 3,708,829.

Domerchie, Garrit A.: *See—*
Fehlau, Bert H.; and Domerchie, Garrit A., 3,709,542.

Domnick, Keith Raphael. Gas filters. 3,708,965, Cl. 55-488.000.

Doniat, Denis: *See—*
Bonnemay, Maurice G.; Bronoel, Guy R.; and Doniat, Denis, 3,709,735.

Donohue, Robert J.; and Joseph, Bernard W., to General Motors Corporation. Method of making a faceted reflector for a lighting unit. 3,710,095, Cl. 240-41.360.

Dorman, Linneaus C., to Dow Chemical Company, The. 3,5-Dihalo-4-amido-alkoxy phenols. 3,709,939, Cl. 260-459.000.

Dornier A.G.: *See—*
Stauber, Siegfried; and Suttner, Klaus, 3,709,056.

Dorwachter, Kirby D.: *See—*
Stahr, Donald F.; and Dorwachter, Kirby D., 3,710,203.

Doss, John L.: *See—*
Estes, Timothy K.; De Winter, Frank G. V.; Doss, John L.; and Higgins, James J., 3,708,929.

Doty, Edward Neal; and Hogg, Walter R., to Coulter Electronics, Inc. Axial trajectory sensor having gating means controlled by pulse duration measuring for electronic particle study apparatus and method. 3,710,263, Cl. 328-91.000.

Doty, Edward Neal; and Hogg, Walter R., to Coulter Electronics, Inc. Axial trajectory having gating means controlled by pulse duration measuring for electronic particle study apparatus and method. 3,710,264, Cl. 328-91.000.

Doucette, Eugene F., to Owens-Illinois, Inc. Mechanical means to apply a plastic template to the necks of containers. 3,708,950, Cl. 53-48.000.

Doughty, Raymond A.: *See—*
Best, Roland W.; Doughty, Raymond A.; and Vander Burgh, Leonard F., 3,709,788.

Douglas, Lawrence M., to Polaroid Corporation. Erecting linkage. 3,709,130, Cl. 95-39.000.

Dow Chemical Company, The: *See—*
Braunlich, Frank H., Jr.; and Bishop, Milton L., 3,709,295.
Croisant, John A.; and Folts, Harold D., 3,709,571.
Dorman, Linneaus C., 3,709,939.
Edamura, Fred Y.; McKendry Lennon H.; and Larsen, Eric R., 3,709,926.
Edmunds, Alvin M.; and Fay, Russell H., 3,709,715.
Glomski, Ronald L.; Davis, Lewis E.; and Grover, Joseph A., 3,709,876.
Jones, Robert D., 3,709,386.
Koeplinger, Ronald D.; Pashak, John F.; and Foerster, George S., 3,709,745.
Tomalia, Donald A.; and Ojha, Narayanlal D., 3,709,904.
Wright, Robert J.; Chapin, John S.; Mah, George; and Karstendiek, Claude A., 3,709,809.

Downer, John Colin: *See—*
Bailey, Malcolm; and Downer, John Colin, 3,708,932.

Downing, Eric William, to Lucas, Joseph, (Industries) Limited. Shuttle type liquid fuel metering device. 3,709,205, Cl. 123-139.0am.

Dowrelio, Antone. Anchor hoist. 3,709,466, Cl. 254-187.000.

Draber, Wilfried; Regel, Erik; Buchel, Karl-Heinz; and Plempel, Manfred, to Farbenfabriken Bayer Aktiengesellschaft. Substituted n-benzylimidazoles. 3,709,901, Cl. 260-310.00r.

Dracon Industries: *See—*
Mason, John R., 3,708,852.

Draege, George E., to Hesston Corporation. Belt drive for plurality of single groove sheaves. 3,709,062, Cl. 74-722.000.

Draeger, Kenneth E., to Esso Research and Engineering Company. Wustite bed improvement. 3,709,679, Cl. 75-26.000.

Dravo Corporation: *See—*
Savage, Elton Stuart, 3,709,364.

Drees, Joseph M., to Signetics Corporation. Integrated circuit bonder. 3,709,424, Cl. 228-44.000.

Dresner, Joseph; and Goodman, Alvin Malcolm, to RCA Corporation. Organic electroluminescent cells having a tunnel injection cathode. 3,710,167, Cl. 313-108.00a.

Dreyfus, Edward: *See—*
Collura, Lawrence, 3,710,111.

Dries, James P., to Doerr Electric Corporation. Convertible thermal safety cut-out switch. 3,710,294, Cl. 337-66.000.

Driscoll, Hiram E., to Hercules Incorporated. Detonator assembly, and booster and blasting system containing same. 3,709,149, Cl. 102-22.000.

Droegemueller, James T.: *See—*
Johnson, Charles D.; and Droegemueller, James T., 3,709,464.

DS-Chemie GmbH & Co. KG: *See—*
Schabel, Joachim; and Liebegott, Hans-Peter, 3,709,725.

Du Pont de Nemours, E. I., and Company: *See—*
Brebner, Donald Lee, 3,709,957.
Hartter, Donald Ray, 3,709,900.
Tarney, Robert Edward; and Verban, John J., 3,709,924.

Duca, James: *See—*
Altemus, William C.; and Duca, James, 3,710,011.

Duchene, Joseph R., to Richardson Chemical Company. Electrodeposition of nickel. 3,709,798, Cl. 204-49.000.

Dudley, Francis, to Excellon Industries. Chuck assembly with centrifugal collet. 3,709,508, Cl. 279-1.00c.

Dukhovny, Rafael Gershonovich; Magarillo, Boris Lvovich; Naidenov, Alexandr Ivanovich; Ovcharov, Bladimir Vasilievich; and Potapjik, Nikolai Nikolaevich, to Chelyabinsky Traktorny Zavod. Directional control valves for the power cylinders of operating elemets of machines. 3,709,103, Cl. 91-437.000.

Dumeah, Peter J., to TRW Inc. Convertible rack and pinion steering gear. 3,709,099, Cl. 91-54.000.

Dummermuth, Ernst, to Allen-Bradley Company. Numerical control servo drive signal generating system. 3,710,222, Cl. 318-604.000.

Dunham-Bush, Inc.: *See—*
Soumerai, Henri; Hoody, Harold W., Jr.; Hamilton, Clark B.; and Blatt, James R., 3,708,959.

Dunlop Holdings Limited: *See—*
Mitchell, William E., 3,708,847.
Mraz, Hans, 3,709,645.

Dunn, Howard E., to Phillips Petroleum Company. Palladium complex olefin dimerization. 3,709,955, Cl. 260-683.15d.

Dunn, Nelson H.: *See—*
Alger, Martin J., Jr.; and Dunn, Nelson H., 3,709,107.
Alger, Martin J., Jr.; and Dunn, Nelson H., 3,709,108.

Dupuis, Maurice V.; and Greer, John R., to Rival Manufacturing Company. Electric brush and lead holder. 3,710,159, Cl. 310-239.000.

Duty, Cermillus H.; Stuit, Steven J.; and Stuit, Jack B. Device and method for removing pollutants from stack gases. 3,708,958, Cl. 55-89.000.

Dynamics Corporation of America: *See—*
Voglesonger, Harry M., 3,710,160.

Dynamit Nobel AG: *See—*
Fuchs, Otto; Bier, Gerhard; and Trautvetter, Werner, 3,709,776.

E-System, Inc., mesne: *See—*
Crom, Carol L., 3,710,333.

Eastman Kodak Company: *See—*
Albers, Kenneth H.; Blood, Alden E.; and Snapp, Thomas C., Jr., 3,709,858.
Balliett, John W.; and Sherwood, William T., 3,710,010.
Beach, David E., 3,709,128.
Bolster, Gene A.; and Mathes, Alva F., 3,708,860.
Cohen, Hyman L.; King, James R., Jr.; and Minsk, Louis M., 3,709,690.
Harvey, Donald M., 3,709,126.
Simon, Hurst; and Birkenmaier, Wilhelm, 3,709,135.
Wood, Lawrence M., 3,709,113.

Eaton Corporation: *See—*
Hamilton, Martin W., 3,710,368.
Smith, Aubrey H., 3,710,216.

Ebinger, Gerog. Guide picket. 3,709,112, Cl. 94-1.500.

Ebner, Cuno; and Schuler, Max, to Sandoz Ltd.; a/k/a Sandoz AG. 1-(m-Tryluoromelkylphenyl)-4-(n-alkyl-n-alkoxy) amino-5-halo-pyridozone-(6). 3,709,885, Cl. 260-250.00a.

Eckenbrecht, Robert Roy: *See—*
Cross, Donald John; Eckenbrecht, Robert Roy; Price, Arthur Burke; and Scott, Benton boyd, 3,710,012.

Eckert, Guenter; Hartmann, Heinrich; Marx, Matthias; and Wuertele, Lothar. Process for finishing leather and synthetic leather substitutes. 3,709,724, Cl. 117-142.000.

Eckert, William F. Insulated plug. 3,710,287, Cl. 339-195.00r.

Ecodyne Corporation, mesne: *See—*
Lindstol, Anders, 3,709,362.

Edamura, Fred Y.; McKendry Lennon H.; and Larsen, Eric R., to Dow Chemical Company, The. Substituted phenoxy-alkanoic acids and derivatives thereof. 3,709,926, Cl. 260-473.00g.

Edemsky, Vladimir Mikhailovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.

Edgar, Owen Burchell; Hughes, William; Lawrence, Derek R.; Lederer, Gerald; and Ritchie, Colin Foster. Titanium dioxide pigments useful in delustring of polyamides. 3,709,710, Cl. 106-300.000.

Edgar, William D.: *See—*
Kinzler, Raymond C.; Edgar, William D.; and Sustarsic, John D., 3,709,794.

Edmonston, William H.; and Carter, Efton T. Carburetor. 3,709,469, Cl. 261-44.00r.

Edmunds, Alvin M.; and Fay, Russell H., to Dow Chemical Company, The. Electroless nickel plating of hollow containers. 3,709,715, Cl. 117-50.000.

Educated Vehicle Systems, Inc.: *See—*
Colsen, Frank Thomas; Kaufman, Peter; and Townsend, Robert L., 3,710,317.

Edwards, James D.; and McQuinn, Max R., to Scott & Fetzer Comapny, The. Rotary switch with retaining clip for grounding shaft for chassis terminal. 3,710,042, Cl. 200-17.00r.

Edwards, William Sterling; Kahn, Paul; and Goodenough, Samuel H., to Cutter Laboratories, Inc. Fabricating equipment for tissue type heart valve. 3,709,175, Cl. 112-262.000.

Efstathioun, John: *See—*
Soule, Winsor, Jr.; and Efstathioun, John, 3,710,325.

Eftefield, Larry G., to Caterpillar Tractor Company. Hoeing apron mechanism with load compensating torsion bar. 3,708,896, Cl. 37-4.000.

Eggenberger, Markus A., to General Electric Company. Digital analog electrohydraulic turbine control system. 3,709,626, Cl. 415-17.000.

Eich, Eckart; and Rochelmeyer, Hans. Manufacture of lysergols. 3,709,891, Cl. 260-285.500.

Eiter, Karl, to Farbenfabriken Bayer Aktiengesellschaft. 3-Nitrosobenzoxazines. 3,709,882, Cl. 260-244.00r.

Electric Power Storage Limited: *See—*
Bushrod, Charles James, 3,709,459.

Electro-Craft Corporation: *See—*
Persson, Erland K., 3,709,000.
Electro-Quimica de Flix S.A.: *See—*
Ambros, Rafael Foguet; Beerwald, Alexander; and Lang, Arnold, 3,708,955.
Electrohome Limited: *See—*
Gutoski, Jerome; and Baillie, Alan J., 3,709,650.
Electronic Data Controls Corporation, mesne: *See—*
Lukens, Samuel C., Jr., 3,709,499.
Electronics Corporation of America: *See—*
Thomson, Elihu Craig, 3,710,149.
Elksnis, Artur Yanovich: *See—*
Abramov, Viktor Petrovich; Junga, Yan Petrovich; Berzin, Gunard Valdemarovich; Skrupsky, Voldemar Petrovich; Frolov, Petr Nikolaevich; Lugovskoi, Andrei Lukyanovich; Shilgorin, Felix Alexandrovich; Dalbinsh, Yan Yanovich; Rotsen, Karl Arturovich; Ziemelis,Andris Eduardovich; Elksnis, Artur Yanovich; and Priede, Bruno Andreevich, 3,709,270.
Ellicott, Olin S., Jr. Cutting tool. 3,709,627, Cl. 408-204.000.
Ellis, Claude E. Bowling game counter. 3,710,080, Cl. 235-92.0ga.
Elsel, Karl Heinz, to Huller, Karl, Gesellschaft mit beschrankter Haftung. Transmission for the feeding movement of mechanical carriage units of machine tools. 3,709,058, Cl. 74-661.000.
Eltra Corporation: *See—*
Seike, Helmut K., 3,710,226.
Emmerson, Calvin W.; and Schwedland, Ronald P., to General Motors Corporation. Blade tip closure. 3,709,632, Cl. 416-97.000.
Engelhard Minerals & Chemicals Corporation: *See—*
Adlhart, Otto J.; and Terry, Peter L., 3,709,736.
Engelman, Ronald: *See—*
Simonson, Harris; Engelman, Ronald; and Levine, Sheldon, 3,709,121.
Engert, Heinz: *See—*
Tupaj, Manfred Paul; and Engert, Heinz, 3,710,035.
Engineered Products Company, The: *See—*
Pietsch, Raymond L., 3,709,456.
Enters, Edward W.; Detjen, Edgar W.; and Rubin, Robert M., to Gilson Bros. Co. Combined lawn mower, lawn vacuum and debris collector. 3,708,968, Cl. 56-16.500.
Enthone, Incorporated: *See—*
Kampe, Marcis M., 3,709,799.
Environment/One Corporation: *See—*
Peters, Philip H., Jr., 3,710,062.
Environmental General Corporation, mesne: *See—*
Matthews, Frank E., 3,709,210.
Eppley, Dewey W.: *See—*
Howard, Donald W.; Eppley, Dewey W.; and Steininger, Hugh D., 3,710,385.
Erdell, John Buckland. Process for producing selected color photographs. 3,709,686, Cl. 96-2.000.
E.R.E. Laboratory, Inc.: *See—*
Brill, Henry L., 3,709,417.
Eriksen, Herluf N. Method, apparatus and system for fiberizing molten mineral material. 3,709,670, Cl. 65-8.000.
Erisman, Maurice J., to FMC Corporation. Nozzles for fluidized bed vessel construction plate. 3,708,887, Cl. 34-57.00a.
Erkfritz, Donald S., to Ingersoll Milling Machine Company, The. Holder for indexable cutting insert. 3,708,843, Cl. 29-105.00a.
Erkfritz, Donald S., to Ingersoll Milling Machine Company, The. Cutting tooth mounting for coarse and fine adjustment. 3,709,625, Cl. 408-181.000.
Espy, Melvin P. Sonic boom reduction. 3,709,446, Cl. 244-1.00n.
Esquire, Inc.: *See—*
McFarlin, Ralph M., 3,710,096.
Esso Production Research Company: *See—*
Kirby, Robert A.; and Propst, Billy J., 3,710,259.
Esso Research and Engineering Company: *See—*
Baird, William C., Jr.; and Surridge, John H., 3,709,921.
Draeger, Kenneth E., 3,709,679.
Flory, John F., 3,708,811.
Forster, Eric O., 3,709,835.
Gerstin, Jeffrey M.; and Kehn, John T., 3,709,848.
Nixon, James; Wallace, Thomas J.; and Beerbower, Alan, 3,709,747.
Zimmerman, Abraham A.; Furlong, Louis E.; and Vadekar, Mohan, 3,709,668.
Estes, John H.: *See—*
Suggitt, Robert M.; Estes, John H.; and Kravitz, Stanley, 3,709,817.
Estes, Timothy K.; De Winter, Frank G. V.; Doss, John L.; and Higgins, James J., to Packaging Corporation of America. Cast in situ deck construction and core unit for use therein. 3,708,929, Cl. 52-98.000.
Ethyl Corporation: *See—*
Baker, Ralph W.; McCarthy, John H.; Place, Harold G.; and Wikman, Andrew O., 3,709,950.
Eto, Mikio: *See—*
Tani, Kaneyasu; Kawazoe, Shiro; Eto, Mikio; Okamots, Sunao; and Fujino, Tamotsu, 3,709,691.
European Atomic Energy Community: *See—*
Grin, Michel; and Pruess, Dietrich, 3,708,865.
European Atomic Energy Community (Euratom): *See—*
Fiebelmann, Peter; Neu, Helmut; and Buzzi, Umberto, 3,709,781.
Evans, Sidley O., to Babcock & Wilcox Company, The. Method of and apparatus for producing a straight bore cold drawn tube. 3,709,020, Cl. 72-283.000.
Ewert, Bruno, to General Motors Corporation. Motor vehicle suspension systems. 3,709,516, Cl. 280-96.20r.
Exatest Messtechnik GmbH: *See—*
Kubisiak, Helmut, 3,710,128.
Excellon Industries: *See—*
Dudley, Francis, 3,709,508.
Exner, Fritz; and Leidig, Theodor, to Haarmann & Reimer Gesellschaft mit beschrankter Haftung. 4-Methyl-2-pentanol crotonate. 3,709,929, Cl. 260-486.00r.
Eymery, Rene, to Commissariat a l'Energie Atomique. Collimation device for irradiation apparatus. 3,710,119, Cl. 250-106.00s.
Fabian, Hein: *See—*
Volker, Ulrich; Fabian, Hein; and Mertl, Klaus, 3,710,071.
Faessinger, Robert W., to Scott Paper Company. Neutral cure wet strength resins prepared by polymerizing glyoxalolated acrylamide with further acrylamide and a basic, nitrogen-containing monomer. 3,709,857, Cl. 162-167.000.
Fairbanks, Theodore H., to FMC Corporation. Method for continuously extruding net-like structures composed of twisted multifilament yarns. 3,709,969, Cl. 264-103.000.
Fairmont Railway Motors, Inc.: *See—*
Johnson, Charles D.; and Droegemueller, James T., 3,709,464.
Faisandier, Jacques, to Societe d'Applications des Machines Motrices. Electro-hydraulic servomechanism. 3,709,257, Cl. 137-625.640.
Farbenfabriken Bayer Aktiengesellschaft: *See—*
Boden, Heinrich; Breer, Karl; Klessmann, Gunther; and Knipp, Ulrich, 3,709,640.
Ditzer, Reiner; and Nickel, Horst, 3,709,871.
Draber, Wilfried; Regel, Erik; Buchel, Karl-Heinz; and Plempel, Manfred, 3,709,901.
Eiter, Karl, 3,709,882.
Neeff, Rutger; and Klauke, Erich, 3,709,916.
Schrader, Gerhard; and Homeyer, Bernhard, 3,709,961.
Schrader, Gerhard; and Hammann, Ingeborg, 3,709,962.
Wolfrum, Gerhard, 3,709,870.
Farbwerke Hoechst Aktiengesellschaft: *See—*
Dobler, Johann; Hausner, Leopold; Kolbe, Andreas; and Tittus, Hans, 3,709,649.
Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Frischkorn, Hans; and Behrenbruch, Horst, 3,709,896.
Gordon, Wolfgang; Kleiner, Hans-Jerg; and Van Spankeren, Ulrich, 3,709,852.
Welmut, Weber; Weyer, Rudi; Aumuller, Walter; Muth, Karl; and Stach, Kurt, 3,709,908.
Farenwald Enterprises, Inc., mesne: *See—*
Piker, Herbert M.; and Borum, Otis C., 3,709,178.
Farinelli, Roberto: *See—*
Ullmann, Werner; Derighetti, Renato; Tadini, Constantino; Farinelli, Roberto; and Mattei, Silvano, 3,710,067.
Farkas, Robert D. Method and construction for package. 3,709,426, Cl. 229-62.500.
Farney, Leonard C.: *See—*
Bloom, Stanley M.; and Farney, Leonard C., 3,709,693.
Farr Company: *See—*
Labadie, Paul A., 3,708,957.
Farrell, George J.; Lyon, Walter R.; Mills, Loring K.; and Shaw, Reginald O., to Polaroid Corporation. Photographic focus adjustment apparatus. 3,709,132, Cl. 95-45.000.
Farrell, John J. Time saver plastic draw back valve assembly. 3,709,644, Cl. 425-160.000.
Faucher, Michele, nee Dufre: *See—*
Anthony, Anne-Marie, nee Barbier; Faucher, Michele, nee Dufre; and Dembinski, Krzysztof, 3,709,998.
Fawcett, James W., to General Electric Company. Envelope rate domodulator. 3,710,267, Cl. 329-192.000.
Fay, Russell H.: *See—*
Edmunds, Alvin M.; and Fay, Russell H., 3,709,715.
Fechter, Leonhard, to Passavant-Werke. Scraper assembly for waste treatment tanks. 3,709,370, Cl. 210-527.000.
Feder, Friedhelm R., to Wedco, Inc. Pneumatic conveyance system. 3,709,562, Cl. 302-13.000.
Federal Paper Board Company, Inc.: *See—*
Arneson, Edwin L., 3,709,400.
Johnson, Harry Joseph; Wolfelsperger, Robert O.; and Davis, Robert Edgar, 3,709,114.
Federal Republic of Germany, as represented by the Federal Defense Minister: *See—*
Tischner, Horst; Schief, Alfred; and Baur, Hugo, 3,710,332.
Feeny, Clement J. Aperture board hanger bracket. 3,709,452, Cl. 248-223.000.
Fegeat, Tony G.: *See—*
Brandt, Robert E.; Fegeat, Tony G.; and Forde, Patrick J., 3,709,002.
Feher, Tibor. Adjustable chair. 3,709,554, Cl. 297-26.000.
Fehlau, Bert H.; and Domerchie, Garrit A., to Highway Trailers of Canada Limited. Trailer bumper. 3,709,542, Cl. 293-73.000.
Feltzin, Joseph; Kuehn, Erich; and Rudkin, George O., Jr., to ICI America Inc. Photoconductive compositions and elements employing polyoxyalkylene bisphenol a fumarates as binders. 3,709,684, Cl. 96-1.500.
Ferguson, Hugo S., to Air Cushion Vehicles, Inc. Air cushion vehicle. 3,709,318, Cl. 180-116.000.
Fernandez, John J. Spark plug with tapered spark gap. 3,710,168, Cl. 313-141.000.

Ferrania S.p.A.: *See—*
Milanese, Vincenzo; and Bianchi, Angelo, 3,709,127.
Ferranti, Limited: *See—*
Nuttall, Roy, 3,709,726.
Ferrari, Eugene A.: *See—*
Adams, William J.; and Ferrari, Eugene A., 3,708,897.
Ferraro, Ralph J., to Leonard, Ward, Electric Co., Inc., mesne. Synchronization of static inverters. 3,710,133, Cl. 307-66.000.
Fiat Societa per Azioni: *See—*
Michellone, Giancarlo; Palazzetti, Mario; and Tabasso, Giovanni, 3,709,566.
Fiber Industries, Inc.: *See—*
MacFarlane, Iain Mackay, 3,708,970.
Fibra-Sonics, Inc.: *See—*
Murray, Edward J., 3,710,034.
Fibreboard Corporation: *See—*
Lubersky, Albert R., 3,709,110.
Fichtel & Sachs A.G.: *See—*
Schulz, Horst, 3,709,341.
Wossner, Felix, 3,709,517.
Fiebelmann, Peter; Neu, Helmut; and Buzzi, Umberto, to European Atomic Energy Community (Euratom). Space nuclear plant. 3,709,781, Cl. 176-39.000.
Field, Thomas R.; and Beckwith, Clinton H., to Jenn-Air Corporation. Dishwasher. 3,709,236, Cl. 134-104.000.
Fielding, Sol B. Sheath assembly for douche nozzle. 3,709,224, Cl. 128-239.000.
Fifield, Thomas B. Circuit board and method of making circuit connections. 3,710,196, Cl. 317-101.0cc.
Figliuzzi, Vincent D. Pilot light burner arrangement. 3,709,653, Cl. 431-279.000.
Filper Corporation: *See—*
Oxendine, Joseph W., Jr.; Happs, Gary J.; and Keltie, Dale A., 3,710,105.
Findeis, Gunter: *See—*
Zahn, Wolfgang; Findeis, Gunter; and Muller, Dieter, 3,709,601.
Finkbeiner, Ludwig: *See—*
Bachle, Karl; Finkbeiner, Ludwig; and Taubitz, Bernd, 3,710,158.
Finzer, Heinz, K.G.: *See—*
Thode, Horst, 3,709,023.
Fischer & Porter Co.: *See—*
Yard, John S., 3,709,213.
Fischer & Porter Company: *See—*
Herzl, Peter J., 3,709,034.
Fischer, Erhard; and Wegner, Gerhard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Materials based on polymers having recurring acetylenically unsaturated groups and curable by irradiation. 3,709,860, Cl. 260-77.5ap.
Fischer, Georg, A.G. Brugg: *See—*
Braunschweiler, Hans Georg, 3,709,262.
Fischer, Robert Frederick: *See—*
Bobeck, Andrew Henry; and Fischer, Robert Frederick, 3,710,356.
Fisher, Alfred G. Vehicle four wheel driving and steering arrangement. 3,709,315, Cl. 180-50.000.
Fitzgerald, Francis J., Jr.: *See—*
Sullivan, Norman M.; and Fitzgerald, Francis J., Jr., 3,709,381.
Flachsbarth, Dieter, to Siemens Aktiengesellschaft. Hall generator system for read-out of magnetized information carriers with several code positions. 3,710,360, Cl. 340-174.10h.
Flander, stanley. Dental implant and method for using the same. 3,708,883, Cl. 32-10.00a.
Flat-Back Corporation: *See—*
Light, Richard U., 3,709,557.
Flesselles, Jacques; and Poupin, Raymond, to Service d'Exploitation Industrielle des Tabacs et des Allumettes. Method and device for constituting a continuous stream of a plurality of superposed layers of rod-shaped objects such as cigarettes. 3,709,350, C. 198-35.000.
Florens, Raymond Leopold; Claes, Frans Henri; and Moisar, Erik, to Agfa-Gevaert. Surface development of an imagewise exposed emulsion containing silver halide grains with cores chemically ripened in two stages. 3,709,689, Cl. 96-64.000.
Florida Machine & Foundry Co.: *See—*
Griffith, Norman N.; and Hollingsworth, John D., 3,708,895.
Flory, John F., to Esso Research and Engineering Company. Single anchor leg single point mooring system. 3,708,811, Cl. 9-8.00p.
Flory, Lester W., to McFarland, L. D., Company. Method and apparatus for deep incising poles. 3,709,271, Cl. 144-309.000.
Floyd, Edwin, Jr., to AMP Incorporated. Circular waveguide joint. 3,708,873, Cl. 29-600.000.
Fluegel, Dale A., to Phillips Petroleum Company. Calibration of analog-to-digital converter. 3,710,376, Cl. 340-347.0cc.
Flugel, Wilhelm, to Quehl, Dr., & Co., GmbH. Phosphorus compounds for flame-proofing fabrics. 3,709,940, Cl. 260-561.00p.
FMC Corporation: *See—*
Erisman, Maurice J., 3,708,887.
Fairbanks, Theodore H., 3,709,969.
Gilmore, Charles G., 3,709,758.
Graham, Edward P., 3,709,451.
Hampton, Quentin L., 3,709,792.
Hemker, Herman W., 3,709,970.
Hickey, Victor F., 3,709,314.
Looker, Olin L.; Zemke, Frederick A.; Knicely, David R.; Rouse, Russell V.; and Slates, Larry L., 3,709,231.
Montgomery, Ronald Eugene; and Incho, Harry Hobart, 3,709,988.
Reimers, James L.; and Mughannam, Adil A., 3,709,352.
Sheetz, Charles E., 3,709,353.
Stahr, Donald F.; and Dorwachter, Kirby D., 3,710,203.
Foerster, George S.: *See—*
Koeplinger, Ronald D.; Pashak, John F.; and Foerster, George S., 3,709,745.
Fogle, James W., to Wheelabrator Corporation, The. Dust collector for use with vertically movable dust generators. 3,708,926, Cl. 51-273.000.
Folk, Dennis L.; and Pavnica, Cyril A., to Bemis Company, Inc., mesne. Sealer for random size shipping cases. 3,708,951, Cl. 53-75.000.
Folts, Harold D.: *See—*
Croisant, John A.; and Folts, Harold D., 3,709,571.
Foltz, Robert E., to Lawrence Brothers, Inc. Panel-supporting carriage. 3,708,827, Cl. 16-98.000.
Ford, Eric Harold, to Lumenition Limited. Transistorized ignition systems. 3,710,131, Cl. 307-10.00r.
Ford Motor Company: *See—*
Burcz, Lawrence D., 3,709,066.
Cherry, James R.; Crow, Joseph W.; and Parker, Robert H., 3,710,383.
Glance, Patrick M., 3,709,316.
Kitzner, Ernest W.; and Rhodes, Alex, 3,709,057.
Nordstrom, John D., 3,709,956.
Tsou, Ivan H., 3,709,846.
Forde, Patrick J.: *See—*
Brandt, Robert E.; Fegeat, Tony G.; and Forde, Patrick J., 3,709,002.
Forschepiepe, Fritz. Mthod for processing slag. 3,709,671, Cl. 65-19.000.
Forster, Eric O., to Esso Research and Engineering Company. Novel compositions with controlled electrical properties. 3,709,835, Cl. 252-513.000.
Forster Mfg. Co., Inc.: *See—*
Harriman, Allen C., 3,709,403.
Forsyth, Robert P., to Polaroid Corporation. Method and apparatus for fabricating imaging means. 3,709,022, Cl. 72-311.000.
Fort Smith Table and Furniture Co.: *See—*
Oglesby, Ira D., Jr., 3,709,159.
Foster Manufacturing Co., Inc.: *See—*
Cruse, Lee H., 3,709,528.
Foster, Norman B.; Yeomans, Robert P.; and Daniels, Robert S., to Space-Age Control, Inc. Survival weapon system. 3,708,902, Cl. 42-1.00r.
Foster Wheeler Corporation: *See—*
Bress, Dellason F., 3,709,793.
Foster, Willard F., to Heist, C. H., Corporation. High pressure jet cleaning device. 3,709,436, Cl. 239-287.000.
Foulds, William Henry: *See—*
Rutherford, Frank; Arenson, Ivor Gerald; Cracknell, Alan George; Foulds, William Henry; and Derrick, Albert, 3,709,577.
Fountain Industries, Inc.: *See—*
Syverson, Martelle J., 3,709,408.
Fowler, Eliot Patrick; and Greaves, Richard William, to United Kingdom Atomic Energy Authority. Semiconductor devices. 3,710,269, Cl. 330-16.000.
Fowler, Vernon J., to GTE Laboratories Incorporated. Optical processor for laser display system. 3,710,015, Cl. 178-5.4bd.
Fox, Homer M., to Phillips Petroleum Company. Process for preparing perfluorocarbon compounds. 3,709,800, Cl. 204-59.00r.
Fox, Richard H.: *See—*
McGough, Gregory J., 3,709,312.
Franckowiak, Sigismond: *See—*
Deschamps, Andre; Franckowiak, Sigismond; Gatellier, Claude; Gltkmans, Georges; and Renault, Philippe, 3,709,784.
Frank, Alan I., to Scan-Data Corporation. Character recognition. 3,709,525, Cl. 283-1.000.
Franke, Rudiger: *See—*
Tax, Hans; and Franke, Rudiger, 3,709,543.
Franklin Electric Co., Inc.: *See—*
Sorensen, Peter F., 3,710,262.
Frantzen, Karl H.: *See—*
Hirt, Thomas J.; Kissinger, Richard D.; and Frantzen, Karl H., 3,710,070.
Frazer, Howard W.: *See—*
Gustafson, Hilding B.; and Frazer, Howard W., 3,709,818.
Frazer, William D.; and Wong, Chak-Kuen, to International Business Machines Corporation. Internal sort program. 3,710,346, Cl. 444-1.000.
Frazier, John F. Radiant surface-heater and temperature sensing assembly. 3,710,076, Cl. 219-449.000.
Free Winds, Inc.: *See—*
McCarthy, James F., 3,709,551.
French, Gerald H., to Mosley Electronics Inc. Electrical connector. 3,710,005, Cl. 174-89.000.
Fridinger, Tomas L.; Mutsch, Edward L.; and Pauly, David R., to Minnesota Mining and Manufacturing Company. Plant growth regulators. 3,709,936, Cl. 260-554.000.
Friedel, Rudolf, to Siemens Aktiengesellschaft. X-ray tube with rotary anodes. 3,710,170, Cl. 313-330.000.
Friedly, Ernest F.: *See—*

McKenzie, Donald J.; and Friedly, Ernest F., 3,709,429.

Friedrich, Gunther: *See—*
Zahn, Wolfgang; Friedrich, Gunther; and Weinert, Volker, 3,709,613.

Frill, Richard K.: *See—*
Jeffrey, William B.; and Frill, Richard K., 3,709,564.

Frischkorn, Hans; and Behrenbruch, Horst, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. 1,4-Bis-benzoxazolyl-(2')-naphthalene derivatives. 3,709,896, Cl. 260-307.00d.

Fritz, William Baird: *See—*
Schor, Ferdinand William; and Fritz, William Baird, 3,710,285.

Froemke, James W.: *See—*
Books, Arlen K.; and Froemke, James W., 3,710,327.

Frohlich, Alfons; Cappel, Marie-Luise; and Stubiger, Ernst, to Opti-Holding AG. Warp-knit slide-fastener stringer. 3,708,836, Cl. 24-205.10c.

Frolov, Petr Nikolaevich: *See—*
Abramov, Viktor Petrovich; Junga, Yan Petrovich; Berzin, Gunard Valdemarovich; Skrupsky, Voldemar Petrovich; Frolov, Petr Nikolaevich; Lugovskoi, Andrei Lukyanovich; Shilgorin, Felix Alexandrovich; Dalbinsh, Yan Yanovich; Rotsen, Karl Arturovich; Ziemelis,Andris Eduardovich; Elksnis, Artur Yanovich; and Priede, Bruno Andreevich, 3,709,270.

Frungel, Frank, to Impulsphysik GmbH. Light blocking arrangement. 3,709,584, Cl. 350-266.000.

Frymoyer, Edward M.; and Johnson, Robert A., to Collins Radio Company. Automatic method of locating the impedance zeros across the frequency spectrum for a crystal filter. 3,710,344, Cl. 444-1.000.

Fuchs, Otto; Bier, Gerhard; and Trautvetter, Werner, to Dynamit Nobel AG. Process for the manufacture of cementable polyvinyl fluoride sheeting. 3,709,776, Cl. 161-189.000.

Fugitt, Ronald B.; and Heckman, Paul J., Jr., to United States of America, Navy. Extended range polarization target. 3,709,580, Cl. 350-157.000.

Fuhrmann, Gustav, to Lever Brothers Company. Container. 3,709,398, Cl. 220-67.000.

Fuji Denki Seizo Kabushiki Kaisha: *See—*
Yabe, Masaya; Takahama, Teizo; Kono, Masaru; and Hirono, Katsumi, 3,710,208.

Fujimori, Motoyuki, to Kabushiki Kaisha Suwa Seikosha. Pallet attracting construction. 3,708,974, Cl. 58-28.00r.

Fujimori, Toshimitsu: *See—*
Yamamoto, Keisuke; and Fujimori, Toshimitsu, 3,710,273.

Fujimoto, Keimei: *See—*
Matsui, Masanao; Kato, Takeaki; Ueda, Kenzo; Mizutani, Toshio; Kitamura, Shigeyoshi; Fujimoto, Keimei; and Okuno, Yositosi, 3,709,910.

Fujimoto, Tadasu; Kuroda, Kotofusa; and Yamamoto, Akira, to Yuasa Battery Company Limited. Leakproof battery and method of manufacturing the same. 3,709,737, Cl. 136-148.000.

Fujimoto, Yasuo, to Kyowa Hakko Kogyo Co., Ltd. Process for synthesizing the di-esters of condensed phosphoric acid. 3,709,873, Cl. 260-211.50r.

Fujino, Tamotsu: *See—*
Tani, Kaneyasu; Kawazoe, Shiro; Eto, Mikio; Okamots, Sunao; and Fujino, Tamotsu, 3,709,691.

Fujio, Yoshio; Kitamura, Yoshihiro; Mihara, Koji; and Hamada, Tsuneakira, to Mitsubishi Denki Kabushiki Kaisha. Television receiver with field intensity indicator. 3,710,016, Cl. 178-5.80r.

Fujitsu Limited: *See—*
Kobayashi, Kengo; and Manabe, Mitsuo, 3,710,363.
Miwa, Osamu; and Kayano, Yosiro, 3,710,349.
Sato, Junzi; and Tanabe, Takako, 3,709,749.
Yoshitake, Norito; and Imazeki, Ryoji, 3,710,350.

Fukuda, Masataro; Miura, Takashi; and Takahashi, Katsuhiro, to Matsushita Electric Industrial Co., Ltd. Method of making a uranium containing catalyst for a metal electrode. 3,709,834, Cl. 252-470.000.

Funaki, Takashi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Directly readable digital clock. 3,708,973, Cl. 58-19.000.

Furlong, Louis E.: *See—*
Zimmerman, Abraham A.; Furlong, Louis E.; and Vadekar, Mohan, 3,709,668.

Furnier-und Sperrholzwerk J. F. Werz, Jr., K.G.: *See—*
Munk, Edmund E., 3,709,646.

Furuichi, Masayoshi, to Katsuragawa Denki Kabushiki Kaisha. Electrophotographic copying machine. 3,709,603, Cl. 355-60.000.

Furuya, Akira: *See—*
Samejima, Hirotoshi; Furuya, Akira; Shimaoka, Keiji; and Aoki, Yoshiatsu, 3,709,701.

Fusco, Philip P. Automatic mitering tool. 3,709,266, Cl. 83-761.000.

GAF Corporation: *See—*
Ulmer, Arnold G., 3,709,596.

Gaiser, Rainer; Riedel, Ekkehard; and Schmid, Lothar, to Siemens Aktiengesellschaft. Circuit arrangement for the connection of a low voltage direct current data transmission systems to a data exchange. 3,710,021, Cl. 178-58.000.

Galantay, Eugene E., to Sandoz-Wander, Inc. 8 Alpha-methyl-substituted-steroids. 3,709,878, Cl. 260-239.550.

Galati, Telemachus Nicolas: *See—*
Papanicolaou, John Paul; and Galati, Telemachus Nicolas, 3,709,181.

Galaxie Manufacturing & Sales, Inc.: *See—*
Napper, Mason Wayne, 3,709,569.

Galbato, Anthony T., to TRW Inc. Anti-friction bearing housing. 3,709,570, Cl. 308-26.000.

Galeano, Sergio F.: *See—*
Amsden, Carl D.; and Galeano, Sergio F., 3,709,975.

Galen, Joseph J.: *See—*
Ciuffini, Anthony J.; and Galen, Joseph J., 3,709,683.

Gallager, Jacob Boon, Jr., to RCA Corporation. Edge connector. 3,710,303, Cl. 339-61.00m.

Gallay, Jean-Jacques: *See—*
Helary, Jean-Louis; De La Graviere, Marcel; and Gallay, Jean-Jacques, 3,709,678.

Gallay, Marielle: *See—*
Helary, Jean-Louis; De La Graviere, Marcel; and Gallay, Jean-Jacques, 3,709,678.

Galowin, Lawrence S.; De Santis, Michael J.; and Miller, Cary, to Singer-General Precision, Inc. Flueric accelerometer. 3,709,041, Cl. 73-515.000.

Gambardella, Mario A., to Olin Corporation. Compression of layers of polyurethane foam containing at least alternate layers of partially cured foam. 3,709,966, Cl. 264-46.000.

Gambill, Ulysses T.: *See—*
Kissell, Ronald E.; and Gambill, Ulysses T., 3,709,076.

Gamble, John Anthony: *See—*
Cooke, Geoffrey Cyril; and Gamble, John Anthony, 3,709,310.

Ganshorn, Peter, to Jaeger, Erich. Device for gas analysis with a rotatable cylindrically shaped chopper. 3,709,600, Cl. 356-51.000.

Gardiner, Terence Edward Gouvenot: *See—*
Petrie, James Alexander; Gardiner, Terence Edward Gouvenot; and Clampitt, John Aaron, 3,709,637.

Garner, Jimmy D. Collapsible portable exercising machine. 3,709,488, Cl. 272-58.000.

Garrett Corporation, The: *See—*
Abbott, Jack W., 3,709,428.

Garry, Annie W.: *See—*
Garry, Thomas Emmett, 3,709,174.

Garry, Thomas Emmett; deceased (by Garry, Annie W.; administratrix). Open top thread cases. 3,709,174, Cl. 112-231.000.

Gartner, William J.: *See—*
Gauger, Edward A., Jr.; Brown, Wallace H.; and Gartner, William J., 3,709,169.

Gaspers, Gunter, to Conrad Kern AG. Supporting structure. 3,708,928, Cl. 52-90.000.

Gasson, Edward James, to BP Chemicals Limited. Catalyst composition. 3,709,829, Cl. 252-461.000.

Gaston Country Dyeing Machine Company: *See—*
Aurich, Christoph W.; Bryant, John C.; and Riley, James R., 3,709,248.

Gatellier, Claude: *See—*
Deschamps, Andre; Franckowiak, Sigismond; Gatellier, Claude; Gltkmans, Georges; and Renault, Philippe, 3,709,784.

Gates Learjet Corporation: *See—*
VeNard, Dan I., II, 3,710,230.

Gauchet, Yves M., to Societe Anonyme Poclain le Plessis-Belleville. Method and device for maneuvering the stabilising stays of a mechanical earth-working vehicle. 3,709,518, Cl. 280-150.500.

Gauger, Edward A., Jr.; Brown, Wallace H.; and Gartner, William J., to Babcock & Wilcox Company, The. Fireproof container. 3,709,169, Cl. 109-29.000.

Gaul, Daniel R., to Crown Molding Co., mesne. Preformer. 3,709,475, Cl. 263-21.00b.

Gebhardt, Otto; Luderer, Fred; and Stahlschmidt, Karl-Heinz, to Mueller, Ernst, K.G., Firma. Process and apparatus for coating objects with powdery substances. 3,709,434, Cl. 239-8.000.

Gebr. Bohler & Co. Aktiengesellschaft: *See—*
Huszar, Josef; and Schon, Konrad, 3,709,097.

Geist, Thomas N.; and Ballas, George C., said Geist assor. to said Ballas, George C. Rotary cutting assembly. 3,708,967, Cl. 56-12.700.

General Cable Corporation: *See—*
Humen, Nicholas; and Brorein, William J., 3,708,853.

General Electric Company: *See—*
Beggs, James E., 3,710,161.
Budlane, Stanley J., 3,710,192.
Church, Ralph E., 3,709,457.
Eggenberger, Markus A., 3,709,626.
Fawcett, James W., 3,710,267.
Grubb, Willard T.; and King, Lawrence H., 3,709,810.
Hall, John W., II, 3,709,729.
Harnden, John D., Jr., 3,710,058.
Harnden, John D., Jr., 3,710,061.
Harnden, John D., Jr., 3,710,187.
Jackson, Arthur L.; Jolly, Shelby A.; and Quirk, John B., 3,710,144.
Kimura, Shiro G., 3,709,774.
Lawyer, John F.; and Prugger, David K., 3,709,319.
Niedrach, Leonard W.; and Bergeron, John A., 3,709,812.
Schlesinger, Kurt, 3,710,176.
Schroeter, Siegfried H., 3,709,944.
Sharp, William T., 3,710,044.
Staub, Fred W.; Corman, James C.; and Walmet, Gunnar E., 3,710,295.
Walker, Bruce H., 3,709,582.
White, Dwain M.; and Hobbs, Stanley Y., 3,709,863.
Witting, Harald L., 3,710,172.

General Electric Company, Limited, The: *See—*

Williams, Charles Edington, 3,710,184.
General Foam Plastics Corporation: *See—*
Chase, Ascher, 3,708,807.
General Foods Corporation: *See—*
Oldershaw, C. G. Peter; and de Kramer, Don, 3,709,351.
General Motors Corporation: *See—*
Barnum, Thomas G., 3,710,367.
Blonn, George W., Sr., 3,710,055.
Buchwald, Robert M., 3,708,822.
Campbell, Gregory A., 3,709,965.
Donohue, Robert J.; and Joseph, Bernard W., 3,710,095.
Emmerson, Calvin W.; and Schwedland, Ronald P., 3,709,632.
Ewert, Bruno, 3,709,516.
Johnston, Richard W., 3,710,215.
Lemoine, Marcel, 3,709,576.
Meyer, Howard M.; and Reichardt, Mayo M., 3,708,849.
Noponen, Harold W., 3,709,204.
Orlando, Vincent A., 3,710,051.
Rice, Hal H., 3,709,772.
Riehl, Wilhelm; and Strobel, Werner Karl, 3,710,093.
Schaefer, Robert H.; and Williams, Richard H., 3,709,064.
Scherer, Carl A.; and Beatenbough, Paul K., 3,708,998.
Seidewand, Edward H., 3,709,006.
Shellhause, Ronald L., 3,709,563.
Truxell, Robert W., 3,708,980.
Valade, Victor D., 3,709,465.
Van Ostrom, David L.; Sweet, Douglas W.; and Beyerlein, David G., 3,709,567.
General Pneumatics Corporation: *See—*
Crane, Michael, 3,708,994.
General Signal Corporation: *See—*
Alger, Martin J., Jr.; and Dunn, Nelson H., 3,709,107.
Alger, Martin J., Jr.; and Dunn, Nelson H., 3,709,108.
General Time Corporation: *See—*
Preiser, Ralph H.; Goodwin, Clarence J.; and Cofoid, Robert D., 3,709,039.
Georgia Kaolin Company: *See—*
Torok, Andrew; and Walsh, Thomas F., 3,709,709.
Georgopoulos, Christos J.: *See—*
Williamson, Robert T.; and Georgopoulos, Christos J., 3,710,145.
Gerard, Michel Jullien: *See—*
Auchapt, Rene; and Gerard, Michel Jullien, 3,710,053.
Gerauer, Ernst A., to Metron Corporation. Non-slip linear to rotary motion conversion apparatus. 3,709,049, Cl. 74-89.200.
Gerholt, Willem, to Industriele Onderneming Wavin N.V. Method for manufacturing a perforated tube. 3,709,972, Cl. 264-236.000.
Gerigk, Gunter: *See—*
Kindl, Erwin; and Gerigk, Gunter, 3,709,720.
Germany, Michael John: *See—*
Bright, Peter Frederick; and Germany, Michael John, 3,710,097.
Gerstin, Jeffrey M.; and Kehn, John T., to Esso Research and Engineering Company. High temperature cure systems for ethylene propylene diene monomers. 3,709,848, Cl. 260-19.0va.
Gerwick, Fred W.: *See—*
Layne, Leslie A., II; and Gerwick, Fred W., 3,709,293.
Gesellschaft fur Kernforschung m.b.H.: *See—*
Becker, Erwin; and Schutte, Rolf, 3,708,964.
Gevaert-Agfa N.V.: *See—*
De Geest, Wilfried Florent; Verkinderen, Paul August; and De Smedt, Felix Frederik, 3,709,964.
Ghafghaichi, Majid; and Tuman, Daniel, to International Business Machines Corporation. Positional dependency monolithic impedance. 3,710,207, Cl. 317-235.00r.
Gianini, Giovanni: *See—*
Rascioni, Vinicio; and Gianini, Giovanni, 3,709,617.
Gibson, Harry T. Methods of and apparatus for detecting minute holes in objects. 3,710,129, Cl. 250-219.0df.
Gibson, Walter Maxwell; and Hutson, Andrew Rhodes, to Bell Telephone Laboratories, Incorporated. Impurity patterns produced by ion implantation. 3,709,741, Cl. 148-1.500.
Gicca, Francis A., to Raytheon Company. Satellite communication system. 3,710,255, Cl. 325-4.000.
Gilbert, Edmond E.: *See—*
Brown, William E.; and Gilbert, Edmond E., 3,708,983.
Gilbert, Ronald E., to Gulf Research & Development Company. Method of manufacturing a fluorinated polymer. 3,709,855, Cl. 260-87.350.
Gilbert, Roswell W., to Technical Management Services, Inc. Alternating and direct current transformer using harmonic modulator. 3,710,135, Cl. 307-88.00r.
Gillemot, George W.; and Thompson, John T. Re-enterable cable splice assembly and method including provision for adding branchout service cables as needed. 3,710,004, Cl. 174-38.000.
Gillessen, Erich: *See—*
Papajewski, Reinhold; and Gillessen, Erich, 3,709,176.
Gillette Company, The: *See—*
Stephenson, Charles F.; Van Dyck, Kenneth A.; and Wyatt, James B., 3,708,879.
Gilmore, Charles G., to FMC Corporation. Strap sealing tool. 3,709,758, Cl. 156-494.000.
Gilson Bros. Co.: *See—*
Enters, Edward W.; Detjen, Edgar W.; and Rubin, Robert M., 3,708,968.
Gindi, Abraham M., to International Business Machines Corporation. Data storage system having skew compensation. 3,710,358, Cl. 340-174.10b.
Girard, Lauret H.: *See—*
Ribich, William A.; Kojabashian, Charles; and Girard, Lauret H., 3,708,833.
Gittos, Maurice Ward; James, John William; and Wiggins, Leslie Frederick, to Aspro-Nicholas Limited. Pharmaceutical compositions containing N-cyclopropyl-1-aminoindane compounds and adapted for administration to obtain inhibition of monoamine oxidase enzye and process. 3,709,996, Cl. 424-330.000.
Givens, Wyatt W.: *See—*
Caldwell, Richard L.; and Givens, Wyatt W., 3,710,112.
Glacier Metal Company Limited, The: *See—*
Stobo, James J., 3,709,797.
Glance, Patrick M., to Ford Motor Company. Cam action safety hood. 3,709,316, Cl. 180-69.00c.
Glass, Marvin, & Associates: *See—*
Barlow, Gordon A., 3,709,494.
Barlow, Gordon A., 3,709,497.
Terzian, Reuben; McKay, Robert S.; and Glass, Marvin I., 3,708,913.
Glass, Marvin I.: *See—*
Terzian, Reuben; McKay, Robert S.; and Glass, Marvin I., 3,708,913.
Glen, Edward C. Single pedal brake-accelerator mechanism with cruise control. 3,709,338, Cl. 192-3.00s.
Glenn, James J., Jr., to Triangle Service Inc. Well bore zone plugging method and apparatus. 3,709,296, Cl. 166-253.000.
Global Marine Inc.: *See—*
Crooke, Robert Curtis, 3,708,990.
Jones, Lynn G., 3,709,261.
Glomski, Ronald L.; Davis, Lewis E.; and Grover, Joseph A., to Dow Chemical Company, The. Water soluble hydroxyethyl methyl cellulose ether thickener for latex paint. 3,709,876, Cl. 260-231.00a.
Gltkmans, Georges: *See—*
Deschamps, Andre; Franckowiak, Sigismond; Gatellier, Claude; Gltkmans, Georges; and Renault, Philippe, 3,709,784.
Gluchowicz, Gerszon, to ABUVA. Device in grinding machines. 3,708,922, Cl. 51-165.920.
Goddar, David: *See—*
Scales, John Tracey; and Goddar, David, 3,708,805.
Goegelman, Robert T.; and Miller, Thomas W., to Merck & Co., Inc. Antibiotic purification process. 3,709,880, Cl. 260-243.00c.
Goellner, Willy J., to Paramount Textile Machinery Co. Method and apparatus for cutting a workpiece. 3,709,075, Cl. 83-27.000.
Goetze, Walter; Kasper, Werner; Klatt, Gerhard; and Schulz, Gerhard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of thiodiglycol. 3,709,945, Cl. 260-609.00r.
Goetzewerke Friedrich Goetze A.G.: *See—*
Christ, Karl, 3,708,885.
Gold, Robert D.: *See—*
Greenberg, Sol; Gold, Robert D.; and Projain, Richard J., 3,710,193.
Golden Cycle Corporation: *See—*
Wilson, Harold W., 3,709,681.
Goldman, Charles B.: *See—*
Cook, Robert M.; and Goldman, Charles B., 3,709,151.
Gomez, Francisco M. Abaca chipper machine. 3,708,830, Cl. 19-5.00r.
Gonzalez, Teodoro J., to American Safety Equipment Corporation. Push button buckle. 3,708,838, Cl. 24-230.000.
Goodenough, Samuel H.: *See—*
Edwards, William Sterling; Kahn, Paul; and Goodenough, Samuel H., 3,709,175.
Goodman, Alvin Malcolm: *See—*
Dresner, Joseph; and Goodman, Alvin Malcolm, 3,710,167.
Goodman, Dennis George, to Lucas, Joseph, (Industries) Limited. Method of manufacturing semi-conductor devices. 3,708,870, Cl. 29-580.000.
Goodman, Stephen R.; and Hu, Hsun, to United States Steel Corporation. Method for producing low carbon steel with exceptionally high drawability. 3,709,744, Cl. 148-12.000.
Goodwin, Clarence J.: *See—*
Preiser, Ralph H.; Goodwin, Clarence J.; and Cofoid, Robert D., 3,709,039.
Goolsby, Patrick F., to Reynolds Metals Company. Chromium electrodes for magnetohydrodynamic generators. 3,710,152, Cl. 310-11.000.
Gordon, Amirav: *See—*
Gross, Jack; and Gordon, Amirav, 3,710,117.
Gordon, Robert Louis; and Siegele, John Charles, to International Paper Company. Case for shipping articles in an upright position and in spaced lateral separation. 3,709,325, Cl. 206-65.00y.
Gordon, Ronnie D.; and Starks, Charles M., to Continental Oil Company. Isomerization of 1,2-dichloro-3-butene to 1,4-dichloro-2-butene. 3,709,949, Cl. 260-654.00r.
Gordon, Wolfgang; Kleiner, Hans-Jerg; and Van Spankeren, Ulrich, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Antistatic thermoplastic moulding compositions. 3,709,852, Cl. 260-88.20s.
Gore, William C.; and Shapiro, Eugene B., to Beatrice Foods Co. Means for controlling the direction of the flow of a liquid or fluid

through a selected outlet and for sealing said outlets. 3,709,256, Cl. 137-625.470.

Gorynina, Zoya Alexandrovna: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.

Gotmalm, Toro Christer. Propelling means for motor boats and auxiliary sailing yachts. 3,709,186, Cl. 115-34.00a.

Gottlob, Heinrich: *See—*
Behn, Reinhard; Gottlob, Heinrich; Hoyler, Gerhard; and Kessler, Hartmut, 3,710,211.

Gotz, Hans. Safety ski binding. 3,709,510, Cl. 280-11.35t.

Gould Inc., mesne: *See—*
Koeblitz, William E., 3,709,212.

Goya, Yoshihito; Nakanishi, Michio; Sawatari, Kenichi; Hirose, Akira; and Shinozawa, Tetsuichi, to Mitsui Toatsu Chemicals Incorporated and Yoshidomi Pharmaceutical Industries. Method and composition for suppressing the nitrification of ammonium nitrogen i soil. 3,709,674, Cl. 71-1.000.

Graf, Mary C. Educational device. 3,708,892, Cl. 35-31.00d.

Graf, Rudolf F.: *See—*
Whalen, George J.; and Graf, Rudolf F., 3,710,371.

Graham, Edward P., to FMC Corporation. Wheel mounted tool support mechanism. 3,709,451, Cl. 248-205.00r.

Graham, Rooonald Lewis; and Pollak, Henry Otto, to Bell Telephone Laboratories, Incorporated. Interconnected loop digital transmission system. 3,710,026, Cl. 179-15.0al.

Granger, Richard J., to Cincinnati Milacron Inc. Fine adjustment mechanism for stock feeding device. 3,709,050, Cl. 74-121.000.

Granger, Wallace H. Ink transfer cylinder mounting with adjustable drive clutch. 3,709,147, Cl. 101-351.000.

Granlund, Gosta Holger: *See—*
Jonason, Arne Holger; and Granlund, Gosta Holger, 3,709,565.

Granta Corporation: *See—*
Wyman, Dennis G.; and Bichell, William J., 3,709,502.

Graver, Richard Byrd: *See—*
Dalton, Jerry Owen; and Graver, Richard Byrd, 3,709,743.

Gray, Alden J., to Howe Richardson Scale Company. Quadrature-to-serial pulse converter. 3,710,265, Cl. 328-61.000.

Gray, Colin, to Crosfield Business Machines Limited. Sheet conveyor and printer which outstacks and prints selected sheets. 3,709,146, Cl. 101-317.000.

Greaves, Richard William: *See—*
Fowler, Eliot Patrick; and Greaves, Richard William, 3,710,269.

Green, Elmer R.: *See—*
Brennan, Timothy A.; and Green, Elmer R., 3,709,395.

Green, Frederick T.: *See—*
Holleran, Thomas M.; and Green, Frederick T., 3,709,489.

Green, George D.; and Weiner, Jerold S., to Cozzoli Machine Company. Automatic tray loader. 3,708,947, Cl. 53-55.000.

Greenberg, Sol; Gold, Robert D.; and Projain, Richard J., to Lambda Electronics Corporation. Hybrid regulated power supply having individual heat sinks for heat generative and heat sensitive components. 3,710,193, Cl. 317-100.000.

Greene, Mervin D., to Jorges Carpet Mills, Inc. Modular tufting unit. 3,709,173, Cl. 112-79.00r.

Greer, John R.: *See—*
Dupuis, Maurice V.; and Greer, John R., 3,710,159.

Grethlein, Hans Erich; and Prescott, William Benjamin, to American Cyanamid Company. Process of color matching. 3,710,345, Cl. 444-1.000.

Greuzard, Charles E., Jr.: *See—*
Greuzard, Charles E., Sr.; and Greuzard, Charles E., Jr., 3,710,023.

Greuzard, Charles E., Sr.; and Greuzard, Charles E., Jr., to International Technical Development Corporation. Sound reproducing system for a four speaker stereo utilizing signal expansion and signal delay. 3,710,023, Cl. 179-1.00g.

Griffith, Norman N.; and Hollingsworth, John D., to Florida Machine & Foundry Co. Replaceable tooth assembly. 3,708,895, Cl. 37-142.00a.

Grigger, John Casimer: *See—*
Dohany, Julius Eugene; and Grigger, John Casimer, 3,709,856.

Grimm, Henry J.: *See—*
Christopher, Charles A., Jr.; Grimm, Henry J.; and Nute, Alton J., 3,709,297.

Grimoldi, Ranoldo H., to Kaiser Steel Corporation. Forming press fixture. 3,709,024, Cl. 72-420.000.

Grin, Michel; and Pruess, Dietrich, to European Atomic Energy Community. Method for magnetic exploding coil welding in special atmospheres. 3,708,865, Cl. 29-4d0.1.

Grint, Ronald D., to JFD Electronics Corporation. Miniature TV antenna. 3,710,337, Cl. 343-701.000.

Griparis, Andrew Geo., to Diversey Corporation, The. Drain valve. 3,709,463, Cl. 251-129.000.

Grobman, William, to Harris-Intertype Corporation. Paperboard convertible printer scorer slotter. 3,709,111, Cl. 93-58.200.

Grooves, William G.; and Tillman, William J., to Smith Kline & French Laboratories. Method of producing gastrointestinal spasmolytic activity with alkylphenoxypoly (ethyleneoxy)ethanols. 3,709,995, Cl. 424-341.000.

Gross, Jack; and Gordon, Amirav, to Yissum Research Development Company of the Hebrew University of Jerusalem. Vitro test system for assessing thyroid function. 3,710,117, Cl. 250-106.00t.

Grossman, Gunter; Moder, Hans-Ulrich; and Schubert, Rolf, to Siemens Aktiengesellschaft. Switching arrangement for a data processing installation. 3,710,029, Cl. 179-18.0es.

Grove, Leslie H. Gear tooth profile. 3,709,055, Cl. 74-462.000.

Grover, Joseph A.: *See—*
Glomski, Ronald L.; Davis, Lewis E.; and Grover, Joseph A., 3,709,876.

Grubb, Willard T.; and King, Lawrence H., to General Electric Company. Hydrogen ion selective sensor and electrode therefor. 3,709,810, Cl. 204-195.00r.

Gruber, Wilhelm; Kleine-Doepke, Wolfgang; Quis, Peter; and Schroeder, Guenther, to Rohm & Haas G.m.b.H. Method of making carboxylic acid anhydrides. 3,709,934, Cl. 260-546.000.

Gruenberg, Selma. Method of producing a fabric and fabric. 3,709,090, Cl. 87-4.000.

Grui, Charles: *See—*
McGough, Gregory J., 3,709,312.

Grundler, Christof: *See—*
Binder, Rolf; Grundler, Christof; and Wildbolz, Rudolf, 3,709,406.

Grunert, Kurt A., to Westinghouse Electric Corporation. Mechanical interlock for electrical contactors. 3,710,288, Cl. 335-160.000.

Gruppo Lepetit S.p.A.: *See—*
Nathansohn, Giangiacomo, 3,709,886.

Grushon, Harold N., to Monarch Marking Systems, Inc. Easy-access pinning machine. 3,709,420, Cl. 227-7.000.

Gruska, Georges, to SEBEC, Societe d'Exploitation de Brevets d'Emballage Cosmetique S.A. Holder for a stick of pasty material comprising an ejectable stick protecting cap. 3,709,618, Cl. 401-78.000.

Grzhimalsky, Leopold Leopoldovich: *See—*
Belkovsky, Viktor Alexandrovich; Grzhimalsky, Leopold Leopoldovich; Ilievsky, Irma Irmovich; Lotsmanov, Sergei Nikolaevich; Petrunin, Ivan Egorovich; Sukhov, Anatoly Vasilievich; Tikhonov, Boris Sergeevich; Levin, Boris Isaakovich; Moroz, Pavel Kirillovich Strekalov, Genrikh Nikolaevich; Chernov, Andrei Nikolaevich; Chizhov, Sergei Ilich; and Shevyakov, Nikolai Nikolaevich, 3,709,682.

GTE Automatic Electric Laboratories Incorporate: *See—*
Deptuch, Kazimierz J., 3,710,354.

GTE Automatic Electric Laboratories Incorporated: *See—*
Pitroda, Satyan G., 3,710,028.

GTE Laboratories Incorporated: *See—*
Fowler, Vernon J., 3,710,015.

GTE Sylvania Incorporated: *See—*
Rhee, Dong Woo, 3,710,171.

Guichet, Niles F. Dental articulator accessory. 3,708,882, Cl. 32-32.000.

Guillen, Francisco J.; and Campanella, Matthew J., to Westinghouse Electric Corporation. High speed an analog-to-digital converter. 3,710,377, Cl. 340-347.0ad.

Guinard, Paul Andre. Method of manufacturing filter elements. 3,708,848, Cl. 29-163.50f.

Gulf & Western Industrial Products Company: *See—*
Hale, Clifford E., 3,709,770.

Gulf & Western Industries, Inc.: *See—*
Hill, Frank W., 3,710,312.

Gulf Research & Development Company: *See—*
Gilbert, Ronald E., 3,709,855.

Gulick, Graham L. Method of treating metal articles. 3,709,803, Cl. 204-140.000.

Gunnewig, Paul: *See—*
Kuipers, Egbert; Gunnewig, Paul; and Menz, Horst, 3,710,290.

Gunson's Sortex Limited: *See—*
Chapman, Thomas Henry, 3,710,099.

Gupta, Virendra N., to Canadian International Paper Company. Bleaching of mechanical pulps with hydrosulfite in the presence of an alkali metal silicate. 3,709,779, Cl. 162-71.000.

Gustafson, Hilding B.; and Frazer, Howard W., to Westinghouse Electric Corporation, mesne. Condensate polishing. 3,709,818, Cl. 210-32.000.

Guthart, Leo A., to Alarm Device Manufacturing Company. Power supply for alarm system. 3,710,134, Cl. 307-66.000.

Guthmann, Herbert, to Volkswagenwerk Aktiengesellschaft. Release device for drum brakes. 3,709,336, Cl. 188-351.000.

Gutman, Arnold D., to Stauffer Chemical Company. Oximinophosphonodithioates. 3,709,959, Cl. 260-940.000.

Gutoski, Jerome; and Baillie, Alan J., to Electrohome Limited. Press for use in the molding of parts. 3,709,650, Cl. 425-367.000.

Gutridge, Jack E., to Pullman Incorporated. Hopper car gate latching mechanism. 3,709,152, Cl. 105-253.000.

Haarhaus, John J.; and McEvilly, Richard J., 10% to Halpern, Joel. Relating to direct reading calculators. 3,710,108, Cl. 235-79.000.

Haarmann & Reimer Gesellschaft mit beschrankter Haftung: *See—*
Exner, Fritz; and Leidig, Theodor, 3,709,929.

Haas, Frank C.: *See—*

Nutter, John F.; Haas, Frank C.; and Thompson, David L., 3,709,974.

Haase, Gunter; and Schopper, Erwin, to Agfa-Gevaert Aktiengesellschaft. Solid particle-track detectors silver chloride monocrystal doped with cadmium and low concentration of lead. 3,709,692, Cl. 96-108.000.

Habgood, Robert P., Jr., to Plexowood, Inc. Palletizable articles. 3,709,326, Cl. 206-65.00r.

Habicht, Ernst; Libis, Bernard; and Zergenyi, Janos, to Ciba-Geigy Corporation. Derivatives of 2,3-dihydro-benzothiophene and benzofuran-2-carboxylic acids. 3,709,909, Cl. 260-330.500.

Hach, Clifford C., to Hach Chemical Company. Iron analysis reagent formulation. 3,709,662, Cl. 23-230.00r.

Hach, Vladimir; Lockhart, Robert William; and Cartlidge, Dennis Murray, to MacMillan Bloedel Limited. Process for the isolation of d-isothujone. 3,709,943, Cl. 260-587.000.

Hack Chemical Company: *See—*
Hach, Clifford C., 3,709,662.

Hagberg, John E., to Westinghouse Electric Corporation. Time delay signal device especially for phase comparison protective relaying system. 3,710,189, Cl. 317-27.00r.

Hagedorn, Erwin C., to Owens-Illinois, Inc. Opalizable alkaline earth aluminosilicate glass compositions. 3,709,705, Cl. 106-54.000.

Hagen, Hans. Drive system for powered vehicles. 3,709,069, Cl. 74-65.000.

Hagey, Robert H.: *See—*
Kimball, Pleasent P.; Hagey, Robert H.; and Macaulay, Malcolm J., 3,710,313.

Hagge, John K.; and Johnson, Frederick W., to Collins Radio Company. Microelectronic heat exchanger pedestal. 3,710,251, Cl. 324-158.00f.

Haken, Klaus: *See—*
Blaschke, Felix; and Haken, Klaus, 3,710,088.

Halase, John F., III: *See—*
Halsey, Homer P.; and Halase, John F., III, 3,710,236.

Hale, Clifford E., to Gulf & Western Industrial Products Company. Decorative exterior panel system for automobiles. 3,709,770, Cl. 161-44.000.

Hall, John W., II, to General Electric Company. Method of making nickel-chrome ohmic contact to p-type silicon carbide. 3,709,729, Cl. 117-227.000.

Hall, Norma T., to Liquid Nitrogen Processing Corporation. Glass reinforced injection molding pellet. 3,709,773, Cl. 161-176.000.

Hall, Richard L. Adjustable toe weight for horses. 3,709,301, Cl. 168-25.000.

Halloran, William X. Combination intramedullary fixation and external bone compression apparatus. 3,709,218, Cl. 128-92.00a.

Halloran, William X. Bone compression device. 3,709,219, Cl. 128-92.00a.

Halpern, Howard S., to United Aircraft Corporation. Twinkle effect display system in which information is modulated at a rate within the flicker frequency of the human eye. 3,710,175, Cl. 315-30.000.

Halpern, Joel: *See—*
Haarhaus, John J.; and McEvilly, Richard J., 3,710,108.

Halsey, Homer P.; and Halase, John F., III. Magnetic leakage field flaw detector utilizing partially overlapping hall probes. 3,710,236, Cl. 324-37.000.

Hamada, Tsuneakira: *See—*
Fujio, Yoshio; Kitamura, Yoshihiro; Mihara, Koji; and Hamada, Tsuneakira, 3,710,016.

Hamblin, Robert J. J., to Universal Oil Products Company. Continuous process for scrubbing H_2S from a gas stream and selectively producing elemental sulfur. 3,709,983, Cl. 423-573.000.

Hamilton, Clark B.: *See—*
Soumerai, Henri; Hoody, Harold W., Jr.; Hamilton, Clark B.; and Blatt, James R., 3,708,959.

Hamilton, Joel A.: *See—*
Mahaffy, Reid A.; Hamilton, Joel A.; and Pinney, Wesley W., 3,709,702.

Hamilton, Martin W., to Eaton Corporation. Boom angle indication system. 3,710,368, Cl. 340-267.00c.

Hamilton, Marton Norman. Cutting tool with replaceable teeth. 3,708,842, Cl. 29-105.00a.

Hamling, Bernard H., to Union Carbide Corporation. Ceramic coated articles. 3,709,717, Cl. 117-70.00c.

Hammann, Ingeborg: *See—*
Schrader, Gerhard; and Hammann, Ingeborg, 3,709,962.

Hammarlund, Per Erik G.; and Sundberg, Yngve S. Means for inductive stirring. 3,709,476, Cl. 266-34.00a.

Hammelmann, Paul. Apparatus for treating continuous surfaces. 3,709,194, Cl. 118-50.100.

Hammond, Francis H.: *See—*
Proell, Wayne A.; Selin, Clifford E.; Holbrook, Stanford T.; and Hammond, Francis H., 3,709,931.

Hammond, Fred H., Jr., to Kendall Company, The. Process for the electrodeposition of polymers. 3,709,808, Cl. 204-181.000.

Hampton, Quentin L., to FMC Corporation. Method and apparatus for treating sewage. 3,709,792, Cl. 210-7.000.

Hanes, James W. E.; Rimmer, Michael J.; Weber, Ronald A.; and Hintzen, Walter J. Method and apparatus for reestablishing underwater guide lines. 3,709,291, Cl. 166-.500.

Haney, Thomas A.: *See—*
Czaplinski, Thomas V.; and Haney, Thomas A., 3,709,365.

Hano, Masaaki; Kiyotake, Takeshi; and Oike, Minoru, to Nippon Kokan Kabushiki Kaisha. Automatic welding apparatus. 3,709,423, Cl. 228-44.000.

Hansen, A. L., Manufacturing Co.: *See—*
Bowers, Thomas S., 3,709,156.

Hansen, James E., to Cutler-Hammer, Inc. Pulse rate control motor speed control system with feedback. 3,710,213, Cl. 318-331.000.

Happs, Gary J.: *See—*
Oxendine, Joseph W., Jr.; Happs, Gary J.; and Keltie, Dale A., 3,710,105.

Hardt, Robert C.; and Kozlow, Edward, to Chemetros Corporation. Solidified gas pellets and apparatus for manufacturing. 3,708,993, Cl. 62-35.000.

Hardtmann, Goetz E., to Sandoz-Wander, Inc. Aryl-substituted-pyrido [2,3-d] pyrimidin-2-ones. 3,709,888, Cl. 260-256.40f.

Harman, James D. Ceiling tile. 3,708,940, Cl. 52-588.00.

Harnden, John D., Jr., to General Electric Company. Switch assembly having wafers of metal oxide varistor material. 3,710,058, Cl. 200-166.00c.

Harnden, John D., Jr., to General Electric Company. Electrical switches and circuits therefor. 3,710,061, Cl. 200-166.00c.

Harnden, John D., Jr., to General Electric Company. Electromagnetic devices having a metal oxide varistor core. 3,710,187, Cl. 317-15.000.

Haroski, Anthony A. Offset seesaw. 3,709,486, Cl. 272-30.000.

Harriman, Allen C., to Forster Mfg. Co., Inc. Web carried toothpick dispenser. 3,709,403, Cl. 221-70.000.

Harrington, John Herbert: *See—*
Tundermann, John Hayes; and Harrington, John Herbert, 3,709,439.

Harris, Charles G. Vending machine for periodicals having arcuate path ejector. 3,709,405, Cl. 221-209.000.

Harris, Richard K.: *See—*
Wilson, Stanley D.; and Harris, Richard K., 3,709,031.

Harris-Intertype Corporation: *See—*
Grobman, William, 3,709,111.

Harrison, Roy C.; and Crain, Donald L., to Phillips Petroleum Company. Purification of polyolefins. 3,709,850, Cl. 260-93.700.

Harrison, William A.: *See—*
Von Schmeling, Bogislav; Harrison, William A.; and Kulka, Marshall, 3,709,992.

Harrison, William B. Stack height control using cutoff knives. 3,709,355, Cl. 198-59.000.

Harry Lime Industries, mesne: *See—*
Cole, Jarold B., 3,708,907.

Hart, Milburn L.: *See—*
Carlson, Ronald E.; and Hart, Milburn L., 3,709,751.

Harte, Kenneth J.: *See—*
Smith, Donald O.; Harte, Kenneth J.; Cohen, Mitchell S.; Newberry, Sterling P.; and Speliotis, Dennis E., 3,710,352.

Hartman, Robert H.; and Strandine, Eldon J. Method of preparing a poultry product. 3,709,699, Cl. 99-107.000.

Hartmann & Braun Aktiengesellschaft: *See—*
Kuipers, Egbert; Gunnewig, Paul; and Menz, Horst, 3,710,290.

Hartmann, Heinrich: *See—*
Eckert, Guenter; Hartmann, Heinrich; Marx, Matthias; and Wuertele, Lothar, 3,709,724.

Hartter, Donald Ray, to Du Pont de Nemours, E. I., and Company. 4,5-Dicyano-2h-imidazoles. 3,709,900, Cl. 260-309.000.

Hartwick, Richard W.: *See—*
Orkin, Stanley S.; and Hartwick, Richard W., 3,709,573.

Hartzell Manufacturing, Inc.: *See—*
Larson, Donald A., 3,708,826.

Harvey, Donald M., to Eastman Kodak Company. Camera with stripping mechanism. 3,709,126, Cl. 95-13.000.

Harvey, Warren L.: *See—*
De Biasse, Richard L.; and Harvey, Warren L., 3,709,561.

Haschek, Leo. Recreational device. 3,708,911, Cl. 46-47.000.

Hasegawa, Katsue: *See—*
Yoshimura, Susumu; Asakawa, Shirow; and Hasegawa, Katsue, 3,709,820.

Hashimoto, Kazuyoshi: *See—*
Hirai, Masuhiko; Takatsu, Toshiharu; Hashimoto, Kazuyoshi; and Hozoji, Akira, 3,709,007.

Hashimoto, Nobuyuki: *See—*
Murakami, Noboru; Naruto, Tatsuo; and Hashimoto, Nobuyuki, 3,709,340.

Hastwell, Peter J., to Savin Business Machines Corporation. Method of and apparatus for electrostatic color printing. 3,709,594, Cl. 355-4.000.

Haszeldine, Robert Neville; Banks, Ronald Eric; and Taylor, David Robin. Rearrangement of bromo-fluorinated propene. 3,709,948, Cl. 260-653.300.

Hata, Kazumi: *See—*
Kodama, Hisashi; Sekigawa, Tsuneo; Hata, Kazumi; and Nakaya, Akimichi, 3,708,989.

Haubold, Herbert: *See—*
Klementz, Peter; Massat, Heinz; Nitschke, Christoph; and Haubold, Herbert, 3,708,969.

Haupt, Robert C., to Allis-Chalmers Manufacturing Company. Sway arrestor for a three point hitch. 3,709,304, Cl. 172-450.000.

Haurie, Michel: *See—*
Desgrandchamps, Guy; Hemmer, Henri; and Haurie, Michel, 3,709,952.

Hauser, Stephen G.: *See—*
Seitz, Lamont J.; and Hauser, Stephen G., 3,709,538.
Hausner, Leopold: *See—*
Dobler, Johann; Hausner, Leopold; Kolbe, Andreas; and Tittus, Hans, 3,709,649.
Hawkins, Fred B. Diagnostic myelography needle. 3,709,211, Cl. 128-2.00a.
Hawkins, John: *See—*
Adams, George; and Hawkins, John, 3,710,037.
Haws Drinking Faucet Company: *See—*
Wright, Allen C., 3,709,254.
Hayakawa, Osamu, to Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.). Detector apparatus for particulate contaminants in a fluid utilizing parallel flow paths. 3,709,614, Cl. 356-208.000.
Hayakawa, Shigeru: *See—*
Matsuo, Yoshihiro; Sasaki, Hiromu; and Hayakawa, Shigeru, 3,709,704.
Hayashi, Tutaka; and Tarui, Yasuo, to Kogyo Gijutsuin; a/k/a Industrial Science and Technology, Agency of and Ministry of International Trade and Industry. Element with turn-on delay and a fast recovery for a high speed integrated circuit. 3,710,041, Cl. 37-300.000.
Haydel, Chester H.: *See—*
Keating, Esmond J.; Haydel, Chester H.; and Knoepfler, Nestor B., 3,709,005.
Hayes, Raymond; and Hayward, Wesley H., to Tektronix, Inc. Storage tube having transmission target with low differential cutoff. 3,710,179, Cl. 315-12.000.
Hayn, Gunther: *See—*
Marek, Josef; and Hayn, Gunther, 3,709,274.
Hayward, Ronald Hamilton, to Scott and White Memorial Hospital and Scott, Sherwood and Brindley Foundation. Endotracheal tube with positive check valve air seal. 3,709,227, Cl. 128-351.000.
Hayward, Wesley H.: *See—*
Hayes, Raymond; and Hayward, Wesley H., 3,710,179.
Hazard, James E.: *See—*
Buhayar, Eric S.; Hazard, James E.; Jaagus, John J.; Werner, Fred W.; Wheeler, Robert W.; and Crowe, Robert C., 3,709,349.
Hch. Bertrams Aktiengesellschaft: *See—*
Kuhnlein, Hans, 3,709,648.
Heald Machine Company, The: *See—*
Youden, David H., 3,708,923.
Hechler, Valentine, IV. Hand operated low pressure valve. 3,709,259, Cl. 137-630.150.
Heckert, David C.: *See—*
Crossley, Guy A.; and Heckert, David C., 3,709,831.
Heckman, Paul J., Jr.: *See—*
Fugitt, Ronald B.; and Heckman, Paul J., Jr., 3,709,580.
Heeren, Vernon L., to United States of America, Navy. Microwave beam scanner circuit. 3,710,389, Cl. 343-7.400.
Heintz, Ralph M.: *See—*
Roundy, Carlos B.; Riddle, John B.; and Heintz, Ralph M., 3,710,218.
Heist, C. H., Corporation: *See—*
Foster, Willard F., 3,709,436.
Heizman, Charles L.: *See—*
Sloane, Edwin A.; and Heizman, Charles L., 3,710,082.
Helary, Jean-Louis; De La Graviere, Marcel; and Gallay, Jean-Jacques; deceased (by Gallay, Marielle; administratrix). Process for the preparation of metals or alloys. 3,709,678, Cl. 75-10.00r.
Held, Edward C., Jr., to Phillips Petroleum Company. Thermoforming oriented hollow articles from two sheets. 3,709,967, Cl. 264-89.000.
Hell, Rudolf; Koll, Roman; and Lifferth, Ewald, to Hell, Rudolf, Dr., Kommanditgesellschaft. Method and apparatus for determining data to be used by electronic photo-type setting devices. 3,710,019, Cl. 178-7.600.
Hell, Rudolf, Dr., Kommanditgesellschaft: *See—*
Hell, Rudolf; Koll, Roman; and Lifferth, Ewald, 3,710,019.
Heller, William C.: *See—*
James, Albert L., 3,709,775.
Helmer, John C., to Varian Associates. Planar retarding grid electron spectrometer. 3,710,103, Cl. 250-49.5ae.
Hemker, Herman W., to FMC Corporation. Apparatus and method for quenching and stabilizing extruded molten filaments. 3,709,970, Cl. 264-176.00f.
Hemmer, Henri: *See—*
Desgrandchamps, Guy; Hemmer, Henri; and Haurie, Michel, 3,709,952.
Henc, Edward V. Feed system for apparatus for performing operations on sheet material. 3,709,483, Cl. 271-44.00r.
Hendricks, Herbert D., to United States of America, National Aeronautics and Space Administration. Method of detecting oxygen in a gas. 3,709,663, Cl. 23-232.00r.
Henelle, Max: *See—*
Yapoudjian, Claude; and Henelle, Max, 3,708,812.
Hennel, Anthony. Amphibious motor bike. 3,709,185, Cl. 115-.500.
Hepworth, Paul; Ripley, Ian Stanley; and Scott, Norman, to Imperial Chemical Industries Limited. Petroleum resins. 3,709,854, Cl. 260-82.000.
Hercock, Robert James; and Scrutton, Simon Lindsay, to Ilford Limited. Photoconductive zinc oxide sensitized by substituted thiazolidene dyes. 3,709,685, Cl. 96-1.700.
Hercules Incorporated: *See—*
Driscoll, Hiram E., 3,709,149.
Herman, David: *See—*
Lerner, Julius O., 3,710,336.
Heron, John B., to Sprague Electric Company. Electrical component having an attached lead assembly. 3,710,210, Cl. 317-258.000.
Herr, Robert L., to Rimar Manufacturing Inc. Offset decorative window grill connection. 3,708,939, Cl. 52-456.000.
Herring, Carl E. Automobile timer. 3,710,246, Cl. 324-162.000.
Herscovitch, William Howard. Convertible rail-highway traction vehicle. 3,709,153, Cl. 105-26.00r.
Herter, Eberhard; and Ulrich, Peter Conrad, to International Standard Electric Corporation. System of time-division multiplex transmission via communications satellites. 3,710,027, Cl. 179-15.0bs.
Herweh, John E.; and Poshkus, Algirdas C., to Armstrong Cork Company. Poly(p-styrenesulfonylhydrazides) as blowing agents for plasticized poly(vinyl chloride). 3,709,844, Cl. 260-2.50p.
Herzig, Robert W., to Sprague Electric Company. Battery operating system timed by coulometers. 3,710,225, Cl. 320-9.000.
Herzl, Peter J., to Fischer & Porter Company. Signal conditioner for recovering dominant signals from swirl-type meters. 3,709,034, Cl. 73-194.00b.
Hesener, Walter: *See—*
Trueb, Viktor; and Hesener, Walter, 3,709,761.
Hess, Karl Gunter; and Werner, Kurt, to Schneider, Jos., & Co. Adapter for television camera. 3,709,133, Cl. 95-45.000.
Hessner, Hans; and Nilsson, Per Olof, to Aktiebolaget Stille Werner. Machine for disintegration of cellulose pulp sheets. 3,709,441, Cl. 241-94.000.
Hesston Corporation: *See—*
Draege, George E., 3,709,062.
Hester, Jackson B., Jr., to Upjohn Company, The. Process for the production of triazolobenzodiazepines and intermediates. 3,709,898, Cl. 260-307.00r.
Hester, Jackson B., Jr., to Upjohn Company, The. 6 Phenyl-4h-s-triazolo [4,3-d] [1,4] benzodiaylpines and their production. 3,709,899, Cl. 260-308.00r.
Hiab-Foco Ak: *See—*
Strandberg, Bengt Sigurd Lennart; and Strandberg, Maj, 3,709,394.
Hibbert, Charles; Kirk, Frederick Arthur; Siddall, Keith; and Howard, Michael Roi, to Osborn-Mushet Tools Limited. Twist drills. 3,709,628, Cl. 408-229.000.
Hickey, Gordon P., to Hoerner-Waldorf Corporation. Method of securing a container to a pallet. 3,708,861, Cl. 29-432.000.
Hickey, Victor F., to FMC Corporation. Terrain vehicle. 3,709,314, Cl. 180-44.00r.
Hicks, Mervyn Lance, to Turn-Styles Limited, mesne. Animal milking and/or treatment apparatus. 3,709,196, Cl. 119-14.040.
Higashino, Toshimitsu, to Nippondenso Kabushiki Kaisha. Battery charging arrangement. 3,710,228, Cl. 320-61.000.
Higgins, James J.: *See—*
Estes, Timothy K.; De Winter, Frank G. V.; Doss, John L.; and Higgins, James J., 3,708,929.
High Energy Processing Corporation: *See—*
Wetherell, Thomas J., 3,709,738.
Highland Laboratories: *See—*
Wlodyka, Edwin W., 3,708,971.
Highley, Thomas T., Jr.; and Paschkis, Albert E., to Leeds & Northrup Company. Recorder chart drive. 3,710,342, Cl. 346-136.000.
Highway Trailers of Canada Limited: *See—*
Fehlau, Bert H.; and Domerchie, Garrit A., 3,709,542.
Hildebrand, Kurt. Releasable ski binding. 3,709,509, Cl. 280-11.35t.
Hill, Frank W., to Gulf & Western Industries, Inc. Method and apparatus for controlling traffic flow in accordance with traffic presence. 3,710,312, Cl. 340-31.00r.
Hill, William Frank, to Lucas, Joseph, (Industries) Limited. Battery charging systems for road vehicles. 3,710,227, Cl. 320-59.000.
Hills, Derek William: *See—*
Bowden, Kenneth; Davis, Robin Alastair; Hills, Derek William; and Sach, George Sidney, 3,709,925.
Hilyard, Byron L.; and Santarossa, Mario C. Spine-adjustment mechanism. 3,709,216, Cl. 128-69.000.
Hinchman, Walter R.; Adrian, Donald J.; and Walters, Andrew W., to United States of America, Navy. F.M. radar range system. 3,710,387, Cl. 343-12.00r.
Hindersinn, Raymond R.: *See—*
Hopkins, George C.; and Hindersinn, Raymond R., 3,709,933.
Hinkers, Bernhard: *See—*
Jaccard, Andre Robert; and Hinkers, Bernhard, 3,709,273.
Hintzen, Walter J.: *See—*
Hanes, James W. E.; Rimmer, Michael J.; Weber, Ronald A.; and Hintzen, Walter J., 3,709,291.
Hirai, Masuhiko; Takatsu, Toshiharu; Hashimoto, Kazuyoshi; and Hozoji, Akira, to Mitsubishi Jukogyo Kabushiki Kaisha. Hydraulically loaded rolling mills. 3,709,007, Cl. 72-8.000.
Hirayanagi, Shigetoshi: *See—*
Mori, Kan; Imaizumi, Fumitake; Sato, Hisaya; Nagaoka, Isao; Hirayanagi, Shigetoshi; Shibata, Toru; and Kawatani, Shigeo, 3,709,851.
Hirono, Katsumi: *See—*
Yabe, Masaya; Takahama, Teizo; Kono, Masaru; and Hirono, Katsumi, 3,710,208.
Hirose, Akira: *See—*
Goya, Yoshihito; Nakanishi, Michio; Sawatari, Kenichi; Hirose, Akira; and Shinozawa, Tetsuichi, 3,709,674.
Hirt, Thomas J.; Kissinger, Richard D.; and Frantzen, Karl H., to Northern Natural Gas Company. Low voltage, compact electrically augmented burner. 3,710,070, Cl. 219-76.000.

Hitachi, Ltd.: *See—*
Aizu, Keiichiro; Kumada, Akio; and Koga, Masashi, 3,710,286.
Itoh, Hisatsugu, 3,710,148.
Kondo, Toshio; and Tamura, Hifumi, 3,710,266.
Nagatani, Takashi, 3,710,102.
Nakamura, Hideo, 3,710,351.
Ohuchi, Yasushi; Kanamaru, Hisanobu; and Honshima, Teruhisa, 3,708,872.
Takahashi, Tadashi; and Onishi, Kazuo, 3,710,219.

Hite, Edward Lee; Ramge, Dennis Lee; and Roelf de Muinck, Andre, to Johns-Manville Corporation. Method and system for sorting spherical articles. 3,709,327, Cl. 209-73.000.

Hoare, Michael R.: *See—*
Bates, Kenneth T.; and Hoare, Michael R., 3,709,999.

Hobbs, John S.: *See—*
de Groot, Cornelis Nicolaas; Hobbs, John S.; and Tonsbeek, Christiaan Herman Theodoor, 3,709,697.

Hobbs, Stanley Y.: *See—*
White, Dwain M.; and Hobbs, Stanley Y., 3,709,863.

Hoeg, Donald F.; Legg, Leo V.; and Tijunelis, Donatas, to Borg-Warner Corporation. Electrical cable. 3,710,007, Cl. 174-120.0ar.

Hoeg, Donald F.; Legg, Leo V.; and Tijunelis, Donatas, to Borg-Warner Corporation. Electrical cable. 3,710,009, Cl. 174-120.0ar.

Hoerner-Waldorf Corporation: *See—*
Hickey, Gordon P., 3,708,861.

Hoff, Wallace J., to Westinghouse Electric Corporation. Normalization circuit for position locator. 3,710,083, Cl. 235-151.300.

Hoffmann, frederick A.: *See—*
Thoma, Paul E.; and Hoffmann, frederick A., 3,708,863.

Hoffmann-La Roche Inc.: *See—*
Leimgruber, Willy; and Weigele, Manfred, 3,709,922.
Miller, O. Neal, 3,709,991.
Spector, Sidney, 3,709,868.

Hoftiezer, Wallace A.: *See—*
Karstensen, Karl W.; Koch, James M.; and Hoftiezer, Wallace A., 3,709,631.

Hogg, Walter R.: *See—*
Doty, Edward Neal; and Hogg, Walter R., 3,710,263.
Doty, Edward Neal; and Hogg, Walter R., 3,710,264.

Hogshead, Fred G., to Caldwell Company, Inc., The. Leveling sling. 3,709,548, Cl. 294-74.000.

Hoigne, Juerg: *See—*
Schamberg, Eckehard; and Hoigne, Juerg, 3,709,718.

Holbrook, Stanford T.: *See—*
Proell, Wayne A.; Selin, Clifford E.; Holbrook, Stanford T.; and Hammond, Francis H., 3,709,931.

Holcomb, John M. Fiber optic illuminator apparatus for scientific instruments. 3,710,091, Cl. 240-2.0ma.

Holgate, Richard L.; and Montgomery, James R., to Mallinckrodt Chemical Works. Radioisotope generator. 3,710,118, Cl. 250-106.00s.

Holleran, Thomas M.; and Green, Frederick T. Hockey skill-testing, practice and game apparatus. 3,709,489, Cl. 273-1.00b.

Hollerl, Alois; and Landgraf, Karl, to Otto Meinel-Georgadel Metallwarenfabrik. Exhaust means for multiple cylinder internal combustion engine. 3,709,320, Cl. 181-40.000.

Hollies, Norman R. S.; and Chafitz, Steven R., to Cotton, Incorporated. Wet fixation of resins in fiber systems for durable press products. 3,709,657, Cl. 8-116.300.

Hollingsworth, John D.: *See—*
Griffith, Norman N.; and Hollingsworth, John D., 3,708,895.

Holmes, W. Church; and Coltrinari, Enzo L., to Sunshine Mining Company. Process for removal of arsenic from sulfo-ore. 3,709,680, Cl. 75-6.000.

Holmstrom, Tage Raymond. Method of caulking or stopping up crevices or filling up joints and the like in buildings. 3,709,711, Cl. 117-2.00r.

Holobeam, Inc.: *See—*
Kruegle, Herman A., 3,709,610.

Holter, Godfrey George: *See—*
Constable, Geoffrey Ernest Patrick; and Holter, Godfrey George, 3,710,136.

Holubinka, Siegmund B. Suction-cleaning implement. 3,708,824, Cl. 15-397.000.

Holzman, Allen L.: *See—*
Iwanciow, Bernard L.; and Holzman, Allen L., 3,709,652.

Homeyer, Bernhard: *See—*
Schrader, Gerhard; and Homeyer, Bernhard, 3,709,961.

Hommerin, Michel: *See—*
Loucheur, Rene; Hommerin, Michel; and Louche, Jean Claude Paul, 3,710,106.

Honda, Takeshi: *See—*
Otsuka, Shinichiro; Honda, Takeshi; and Yamanoi, Akio, 3,709,785.

Honeywell Inc.: *See—*
Mc Pherson, Gary C., 3,710,355.
Miller, Robert C., 3,710,123.

Honeywell Information Systems, Inc.: *See—*
Hunter, John C.; and Beard, Albert L., 3,710,328.
Powell, William C., 3,710,318.

Honshima, Teruhisa: *See—*
Ohuchi, Yasushi; Kanamaru, Hisanobu; and Honshima, Teruhisa, 3,708,872.

Hoody, Harold W., Jr.: *See—*
Soumerai, Henri; Hoody, Harold W., Jr.; Hamilton, Clark B.; and Blatt, James R., 3,708,959.

Hooker Chemical Corporation: *See—*
Hopkins, George C.; and Hindersinn, Raymond R., 3,709,933.
Lee, Sung Ki, 3,709,714.
Miller, George T., 3,709,727.

Hopkins, George C.; and Hindersinn, Raymond R., to Hooker Chemical Corporation. Nitrilotriacetyltriachloride. 3,709,933, Cl. 260-544.00y.

Hopkins, Richard H.; Roland, George W.; Partlow, William D.; and Steinbruegge, Kenneth B., to Westinghouse Electric Corporation. Calcium-yttrium silicate oxyapatite lasers. 3,710,278, Cl. 331-94.500.

Horton, Edward E., to Deep Oil Technology, Inc. Anchor means and method of installing the same. 3,709,182, Cl. 114-206.00r.

Horwell, John E., to Square D Company. Insulating base and neutral wire connector assembly for circuit breaker panelboard. 3,710,308, Cl. 339-198.00n.

Hospital Service Technology Corporation: *See—*
Brennan, Timothy A.; and Green, Elmer R., 3,709,395.

Hotz, Karl, to Siemens Aktiengesellschaft. Apparatus for cleaning tubes and the like. 3,708,818, Cl. 15-97.000.

Houdaille Industries, Inc.: *See—*
Obergefell, Ronald F.; and Kish, Edward E., 3,709,433.

Houghton, Norman F., to Philco Ford Corporation. Method of forming articles comprising a pair of adjacent walled structure having unidirectionally presented openings. 3,709,968, Cl. 264-92.000.

Houlihan, William J.: *See—*
Cooke, George A.; and Houlihan, William J., 3,709,887.

Houlihan, William J., to Sandoz-Wander, Inc. N-Substituted sulfamoyl compounds useful as herbicides. 3,709,677, Cl. 71-94.000.

Houlihan, William J., to Sandoz-Wander, Inc. 2,6-Dihalo-m-substituted-benzoic acid amides. 3,709,938, Cl. 260-558.00d.

Howard, Donald W.; Eppley, Dewey W.; and Steininger, Hugh D., to Bendix Corporation, The. Vehicle initial speed and stopping distance indicator. 3,710,385, Cl. 343-9.000.

Howard, John Arthur; and Sergant, Gwendolen Alice. Pallets. 3,709,160, Cl. 108-51.000.

Howard, Michael Roi: *See—*
Hibbert, Charles; Kirk, Frederick Arthur; Siddall, Keith; and Howard, Michael Roi, 3,709,628.

Howe, Hans-Ulrich, to Klockner-Humboldt-Deutz Aktiengesellschaft. Piston cooling arrangement for a reciprocating piston internal combustion engine with an injection nozzle. 3,709,109, Cl. 92-186.000.

Howe, Ralph S., Jr., to Textron, Inc. Shaft locking device. 3,709,575, Cl. 308-236.000.

Howe Richardson Scale Company: *See—*
Gray, Alden J., 3,710,265.

Howmet International, Inc.: *See—*
Pohl, Fritz G.; and Keller, Arnold, 3,709,630.

Hox, Hans Werner; and Bechem, Werner. Method of an annular-strip rolling mill for rolling out an endless strip from a cast ring. 3,709,018, Cl. 72-111.000.

Hoyler, Gerhard: *See—*
Behn, Reinhard; Gottlob, Heinrich; Hoyler, Gerhard; and Kessler, Hartmut, 3,710,211.

Hozoji, Akira: *See—*
Hirai, Masuhiko; Takatsu, Toshiharu; Hashimoto, Kazuyoshi; and Hozoji, Akira, 3,709,007.

Hrach, Josef; and Wimmer, Theodor. Method for the production of polyesters with a novel multicomponent catalyst. 3,709,859, Cl. 260-75.00r.

Hu, Hsun: *See—*
Goodman, Stephen R.; and Hu, Hsun, 3,709,744.

Hubbard, John F.: *See—*
Massa, Frank; and Hubbard, John F., 3,710,151.

Huber, Angela. Method for making a hand knotted pile fabric. 3,709,536, Cl. 289-1.500.

Hubert, Helmut; Jung, Anton L.; Lapczyna, Manfred; Ledwon, Erhard; Rock, Wilfried; and Schmidt-Burbach, Gerhard, to Buderus'sche Eisenwerke. Heater-timing apparatus. 3,710,077, Cl. 219-492.000.

Hubscher, Thomas. Ige (ye) sensitive immunodiffusion plate. 3,709,661, Cl. 23-253.00r.

Hughes Aircraft Company: *See—*
Kreinheder, Donald E., 3,710,390.

Hughes, William: *See—*
Edgar, Owen Burchell; Hughes, William; Lawrence, Derek R.; Lederer, Gerald; and Ritchie, Colin Foster, 3,709,710.

Huller, Karl, Gesellschaft mit beschrankter Haftung: *See—*
Elsel, Karl Heinz, 3,709,058.

Humen, Nicholas; and Brorein, William J., to General Cable Corporation. Wire terminating machine. 3,708,853, Cl. 29-203.00d.

Hunt, Charles d'A., to Airco, Inc. Apparatus for continuous casting. 3,709,284, Cl. 164-281.000.

Hunt, R. Brian. Game rifle camera. 3,709,124, Cl. 95-12.000.

Hunter, John C.; and Beard, Albert L., to Honeywell Information Systems, Inc. Method and apparatus for communicating devices each performing preprocessing operations on data autonomously of the central processor. 3,710,328, Cl. 340-172.500.

Hurth, Carl, Maschinen- und Zahnradfabrik: *See—*
Loos, Herbert, 3,709,015.

Hurwitz, Michael J., to Westinghouse Electric Corporation. Ultrasonic inspection apparatus. 3,709,029, Cl. 73-67.80r.

Huszar, Josef; and Schon, Konrad, to Gebr. Bohler & Co. Aktiengesellschaft. Drilling support for a rock perforator. 3,709,097, Cl. 173-44.000.

Hutchins, Thomas B., IV; and Templeton, William M., to Tektronix, Inc. Direct viewing storage tube having mesh halftone target and nonmesh bistable target. 3,710,173, Cl. 315-12.000.

Hutson, Andrew Rhodes: *See—*
Gibson, Walter Maxwell; and Hutson, Andrew Rhodes, 3,709,741.

Hutson, Thomas, Jr.; and Ritter, Ronald E., to Phillips Petroleum Company. Method of controlling an oxidative dehydrogenation. 3,709,951, Cl. 260-680.00e.

Hyca, Bohumil, to Zbrojovka Brno, narodni podnik. Device for repairing punch tape provided with code holes and feed holes. 3,709,759, Cl. 156-527.000.

Hyca, Bohumil, to Zbrojovka Brono, narodni podnik. Device for repairing puncb tape provided with code holes and feed holes. 3,709,760, Cl. 156-527.000.

Hyde, Richard E., to Strolee of California. Brace assembly. 3,709,454, Cl. 248-351.000.

Ibex; division of Jelco: *See—*
Davis, Walter L., 3,709,521.

ICI America Inc.: *See—*
Feltzin, Joseph; Kuehn, Erich; and Rudkin, George O., Jr., 3,709,684.

Idaho Bank of Commerce: *See—*
Quinney, James L., 3,708,841.

Ideavelopment, Inc.: *See—*
Walstrom, Leslie R., 3,709,401.

Idemitsu Kosan co., Ltd.: *See—*
Kunichika, Sango; Sakaibara, Yasumasa; Kyotofu, Noguchi; Akio, Kurisaki; Konomu, Kato; and Uchiyama, Mitsuru, 3,709,927.

Iguchi, Jintaro; and Tokushige, Hiroyuki, to Japan Steel Works Ltd. Plunger pump cylinder for use in treating highly corrosive fluid. 3,709,638, Cl. 417-454.000.

Iizuka, Yoshio: *See—*
Yoshida, Norio; Tomita, Kuniyuki; and Iizuka, Yoshio, 3,709,906.

Ikeda, Hironosuke; and Kondo, Tetsuya, to Sanyo Electric Co., Ltd. Coulometer with solid electrolyte. 3,710,201, Cl. 317-230.000.

Ikeda, Mitsuyuki: *See—*
Deguchi, Yutaka; Kashihara, Hideo; Koozuki, Rikuzo; Takahashi, Kazuyoshi; and Ikeda, Mitsuyuki, 3,708,962.

Ilford Limited: *See—*
Hercock, Robert James; and Scrutton, Simon Lindsay, 3,709,685.

Ilievsky, Irma Irmovich: *See—*
Belkovsky, Viktor Alexandrovich; Grzhimalsky, Leopold Leopoldovich; Ilievsky, Irma Irmovich; Lotsmanov, Sergei Nikolaevich; Petrunin, Ivan Egorovich; Sukhov, Anatoly Vasilievich; Tikhonov, Boris Sergeevich; Levin, Boris Isaakovich; Moroz, Pavel Kirillovich Strekalov, Genrikh Nikolaevich; Chernov, Andrei Nikolaevich; Chizhov, Sergei Ilich; and Shevyakov, Nikolai Nikolaevich, 3,709,682.

Imaizumi, Fumitake: *See—*
Mori, Kan; Imaizumi, Fumitake; Sato, Hisaya; Nagaoka, Isao; Hirayanagi, Shigetoshi; Shibata, Toru; and Kawatani, Shigeo, 3,709,851.

Imazeki, Ryoji: *See—*
Yoshitake, Norito; and Imazeki, Ryoji, 3,710,350.

Imperial Chemical Industries Limited: *See—*
Hepworth, Paul; Ripley, Ian Stanley; and Scott, Norman, 3,709,854.

Impex-Essen Vertrieb von Werkzeugen GmbH: *See—*
Kolmar, Herbert, 3,709,421.

Impulsphysik GmbH: *See—*
Frungel, Frank, 3,709,584.

Inamorato, Jack Thomas, to Colgate-Palmolive Company. Built anionic detergent composition having inverse foam-to-temperature relationship and process for producing same. 3,709,836, Cl. 252-525.000.

Incho, Harry Hobart: *See—*
Montgomery, Ronald Eugene; and Incho, Harry Hobart, 3,709,988.

Indiana Metal Treating, Inc.: *See—*
Keifer, John N., 3,708,856.

Industriele Onderneming Wavin N.V.: *See—*
Gerholt, Willem, 3,709,972.

Information Design, Inc.: *See—*
Priest, Lyle Gilbert, 3,710,221.

Ingersoll Milling Machine Company, The: *See—*
Erkfritz, Donald S., 3,708,843.
Erkfritz, Donald S., 3,709,625.

Ingham, John W., Jr., to AMF Incorporated. Reserve fuel valve position indicator. 3,709,317, Cl. 180-103.000.

Inland Steel Company: *See—*
Slagley, William E.; Seifert, Gerald R.; and Valonis, Edmund J., 3,710,084.

Inmont Corporation: *See—*
Loew, Frederic Christian; Stone, Edward; and Civardi, Frank Peter, 3,709,864.

Inrescor A.G.: *See—*
Schamberg, Eckehard; and Hoigne, Juerg, 3,709,718.

Institut Elektrosvarki Imeni E.O. Patonia Akademii: *See—*
Pokhodnya, Igor Konstantinovich; Shlepakov, Valery Nikolaevich; and Alter, Vladimir Fedorovich, 3,710,073.

Institut Francais des Petrole, des Carburants et Lubrifiants: *See—*
Deschamps, Andre; Franckowiak, Sigismond; Gatellier, Claude; Gltkmans, Georges; and Renault, Philippe, 3,709,784.

Institut Rhimii Drevesiny Akademii Nauk Latviiskai SSR: *See—*
Abramov, Viktor Petrovich; Junga, Yan Petrovich; Berzin, Gunard Valdemarovich; Skrupsky, Voldemar Petrovich; Frolov, Petr Nikolaevich; Lugovskoi, Andrei Lukyanovich; Shilgorin, Felix Alexandrovich; Dalbinsh, Yan Yanovich; Rotsen, Karl Arturovich; Ziemelis,Andris Eduardovich; Elksnis, Artur Yanovich; and Priede, Bruno Andreevich, 3,709,270.

Institute of Food and Agriculture Sciences, The: *See—*
Killinger, Gordon B.; and Beckham, Clarence F., 3,709,694.

Inter-Computer Electronics, Inc.: *See—*
Zeiger, Kenneth K., 3,710,141.

Intercan S.A.: *See—*
Nasica, Jean R., 3,709,643.

International Basic Economy Corporation: *See—*
Raymond, Robert E., 3,708,977.

International Business Machines Corporation: *See—*
Andrews, Douglas R.; and Kimmel, Milton J. (said Kimmel assor. to), 3,710,323.
Barrager, Stephen M.; and Smith, Sidney H., 3,710,235.
Books, Arlen K.; and Froemke, James W., 3,710,327.
Buslik, Walter S., 3,710,357.
Craft, David J., 3,710,348.
Cralle, Walter O., Jr.; and Lennon, Kenneth A., 3,710,079.
De Witt, David, 3,709,746.
Frazer, William D.; and Wong, Chak-Kuen, 3,710,346.
Ghafghaichi, Majid; and Tuman, Daniel, 3,710,207.
Gindi, Abraham M., 3,710,358.
Jacobs, John T.; Keester, Kenneth L.; and Silverman, Benjamin D., 3,710,353.
Lipp, James, 3,709,586.
Makosch, Gunter, 3,709,579.
Papadopoulos, John; Prince, David A.; and Reilly, Roger F., 3,710,069.
Rubenstein, David A., 3,710,321.
Segal, Zvi, 3,709,378.
Wiley, John P., 3,709,125.

International Nickel Company, Inc., The: *See—*
Tundermann, John Hayes; and Harrington, John Herbert, 3,709,439.

International Paper Company: *See—*
Gordon, Robert Louis; and Siegele, John Charles, 3,709,325.

International Standard Electric Corporation: *See—*
Dartois, Jean-Pierre Andre, 3,710,030.
Herter, Eberhard; and Ulrich, Peter Conrad, 3,710,027.

International Technical Development Corporation: *See—*
Greuzard, Charles E., Sr.; and Greuzard, Charles E., Jr., 3,710,023.

International Telephone and Telegraph Corporation: *See—*
Brzozowski, Stephen Joseph; and Polkinghorn, Melvin William, 3,710,047.
Burgess, James P.; Polkinghorn, Melvin W.; and Dieterle, Gunther, 3,710,049.
Cahill, Robert Francis, 3,708,946.
Channell, Andrew Willis; Shikasho, Satoru; and Sommer, Gilbert Robert, 3,709,431.
Cooper, James Joseph, Jr., 3,710,307.
Pate, James Ronald, 3,710,130.
Reif, Philip George, 3,710,126.
Sellari, Daniele, Jr., 3,710,031.
Thomas, Delmer L., 3,710,281.

Introini, Vittorio. Modular storage and display assembly. 3,709,578, Cl. 312-245.000.

Irby, James E. Infant restrainer. 3,708,808, Cl. 5-95.000.

Isaev, Alexei Ilich; Pevzner, Semen Albertovich; and Zemtsov, Jury Semenovich, to Kramatorsky Nauchno-Issledovatelski i Proektno-tekhnologichesky institut mashinostroenia. Device for lapping tapered mating surfaces of parts. 3,708,919, Cl. 51-26.000.

Isheden, Lars Rune: *See—*
Andersson, Tage Vilhelm Leander; Isheden, Lars Rune; Johansson, Bo Emil; and Warring, Stig Erik, 3,710,372.

Ishiguro, Takeshi: *See—*
Ohata, Shuichi; Takeuchi, Yoji; and Ishiguro, Takeshi, 3,710,089.

Ishikawa, Michio: *See—*
Kanzaki, Toshihiko; Nakatsui, Isamu; Sugiyama, Yoshio; Nishio, Masaaki; and Ishikawa, Michio, 3,709,787.

Ishikawojima-Harima Jukogyo Kabushiki Kaisha: *See—*
Shiozaki, Hiroyuki; and Takahashi, Norio, 3,709,009.

Israel Aircraft Industries Ltd.: *See—*
Avital, Ron, 3,710,311.

Issa, Manuel: *See—*
Koenig, Martin F.; De Backer, Frank A.; and Issa, Manuel, 3,710,300.

Iten, Paul D., to Aktiengesellschaft Brown, Boveri & Cie. Laser doppler flow probe with high spatial resolution. 3,709,599, Cl. 356-28.000.

Ito, Shin, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic control system for transmissions. 3,709,067, Cl. 74-869.000.

Ito, Toshio; Nomaguchi, Tamotsu; and Tabata, Norikazu, to Mitsubishi Electric Corporation. Heating apparatus. 3,709,473, Cl. 263-19.00r.

Itoh, Hisatsugu, to Hitachi, Ltd. Ripple eliminating circuit. 3,710,148, Cl. 307-295.000.

Ives, Frank E. Static mixing dispenser and mixing method. 3,709,468, Cl. 259-4.000.

Ivey, John Saxon, to Borg-Warner Limited. Hydraulic coupling. 3,709,635, Cl. 416-183.000.

Iwanciow, Bernard L.; and Holzman, Allen L., to United Aircraft Corporation. Very long burn duration hybrid combustor. 3,709,652, Cl. 431-96.000.

Iwasawa, Hiroshi, to Citizen Watch Company Limited. Process for the prevention of unintentional escapement of an applied oil layer. 3,709,324, Cl. 184-1.00e.

Ja-Dor Inc.: *See—*
Seibert, Franklin J., 3,708,802.

Jaagus, John J.: *See—*
Buhayar, Eric S.; Hazard, James E.; Jaagus, John J.; Werner, Fred W.; Wheeler, Robert W.; and Crowe, Robert C., 3,709,349.

Jablonowski, Virginia H. Therapeutic legging. 3,710,075, Cl. 219-211.000.

Jaccard, Andre Robert; and Hinkers, Bernhard, to Jaccard Corporation. Food slicing apparatus. 3,709,273, Cl. 83-751.000.

Jaccard Corporation: *See—*
Jaccard, Andre Robert; and Hinkers, Bernhard, 3,709,273.

Jachimek, Thomas P., to Seeburg Corporation of Delaware, The. Additional credit required indicator in vending machine. 3,710,320, Cl. 340-149.00r.

Jackman, Arthur E., to Jackman-Conlin Associates, Inc. Strand processing apparatus. 3,709,021, Cl. 72-289.000.

Jackman-Conlin Associates, Inc.: *See—*
Jackman, Arthur E., 3,709,021.

Jackson, Arthur L.; Jolly, Shelby A.; and Quirk, John B., to General Electric Company. High power microwave system having low duty cycle. 3,710,144, Cl. 307-260.000.

Jackson, Charles A.; and Katz, Martin B., to Thiokol Chemical Corporation. Woven fabric for nursery plant root balls. 3,709,263, Cl. 139-420.000.

Jacobs, John E.; and Kovac, Michael G., to Northwestern University. Secondary emission enhancer for an X-ray image intensifier. 3,710,125, Cl. 250-213.0vt.

Jacobs, John J., to Re Jo Multi Colour, Inc. Multi-color anodizing process for aluminum. 3,709,742, Cl. 148-6.100.

Jacobs, John T.; Keester, Kenneth L.; and Silverman, Benjamin D., to International Business Machines Corporation. Thermal capacitative-ferroelectric storage device. 3,710,353, Cl. 340-173.200.

Jaeger, Erich: *See—*
Ganshorn, Peter, 3,709,600.

Jaffe, Joseph, to Chevron Research Company. Hydrofining-hydrocracking process using palladium-containing catalyst. 3,709,814, Cl. 208-59.000.

Jakob, Hans, to American Safety Equipment Corporation. Child safety seat. 3,709,558, Cl. 297-250.000.

Jalbert, Donald A. Plastic lobster trap. 3,708,905, Cl. 43-100.000.

James, Albert L., 60% to Heller, William C. Product compositions for magnetic induction methods to treat and heat-seal predetermined areas of parent units. 3,709,775, Cl. 161-162.000.

James, Jack C., to Disney, Walt, Productions. Articulated vehicle. 3,709,313, Cl. 180-21.000.

James, John William: *See—*
Gittos, Maurice Ward; James, John William; and Wiggins, Leslie Frederick, 3,709,996.

Janson, Paul E.: *See—*
Cohen, John B.; Janson, Paul E.; Mc Farland, Harold L., Jr.; and Young, James B., Jr., 3,710,324.

Janssen, Eduard Jozef Philomena: *See—*
T'Jampens, Germain Remi; Notelteirs, Victor Rosallie; and Janssen, Eduard Jozef Philomena, 3,710,169.

Japan Exlan Company, Limited: *See—*
Shimoda, Keitaro; Tsutsui, Nobuhiro; Zoda, Keiichi; and Ueki, Masayuki, 3,709,971.

Japan Gas-Chemical Company, Inc.: *See—*
Murayama, Masayuki; and Abe, Koichi, 3,709,928.

Japan Steel Works Ltd.: *See—*
Iguchi, Jintaro; and Tokushige, Hiroyuki, 3,709,638.

Japan Synthetic Paper Company Ltd.: *See—*
Tani, Kaneyasu; Kawazoe, Shiro; Eto, Mikio; Okamots, Sunao; and Fujino, Tamotsu, 3,709,691.

Japan Synthetic Rubber Co., Ltd.: *See—*
Mori, Kan; Imaizumi, Fumitake; Sato, Hisaya; Nagaoka, Isao; Hirayanagi, Shigetoshi; Shibata, Toru; and Kawatani, Shigeo, 3,709,851.

Jaromir Tobias Rhinebeck: *See—*
Culberson, Donald L., 3,709,104.

Jason, George: *See—*
McConnell, Frederick C.; Jason, George; and Armstrong, Neil J., 3,709,607.

Jefferies, Patrick J.; and Crounse, Nathan N., to Sterling Drug Inc. Water-soluble quaternary ammonium phthalocyanine dyestuffs. 3,709,903, Cl. 260-314.500.

Jeffrey, William B.; and Frill, Richard K., to Westinghouse Air Brake Company. Combined electronic and fluid pressure brake apparatus. 3,709,564, Cl. 303-16.000.

Jenn-Air Corporation: *See—*
Field, Thomas R.; and Beckwith, Clinton H., 3,709,236.

Jennings, Kingsley Jeffrey; and Ward, Frederick Gifford, to Morris, Herbert, Limited. Racks for storage and transfer purposes. 3,709,383, Cl. 214-16.00b.

Jespersen, Knut Indergaard: *See—*
Sayce, Leonard Alfred; and Jespersen, Knut Indergaard, 3,710,124.

Jessee, Ralph D., to Westinghouse Electric Corporation. Integrator controlled inverter. 3,710,229, Cl. 321-9.00a.

Jette, Emile, Jr. Door latch operated switch unit. 3,710,052, Cl. 200-61.680.

JFD Electronics Corporation: *See—*
Grint, Ronald D., 3,710,337.
Mayes, Paul E., 3,710,340.

Jochim, La Vergne C., to Ti-Mind Incorporated. Timer with adjustable conductive brush means and resettable conductive pins. 3,710,045, Cl. 200-37.00r.

Joerns, Guenter: *See—*
Von Gottberg, Horst; Schaefer, Gerd; and Joerns, Guenter, 3,709,190.

Johansson, Bo Emil: *See—*
Andersson, Tage Vilhelm Leander; Isheden, Lars Rune; Johansson, Bo Emil; and Warring, Stig Erik, 3,710,372.

Johns-Manville Corporation: *See—*
Hite, Edward Lee; Ramge, Dennis Lee; and Roelf de Muinck, Andre, 3,709,327.
Meserole, Robert H., 3,708,867.

Johnson & Johnson: *See—*
Tunc, Deger, 3,709,877.

Johnson, Carl L. Ore classifier. 3,709,359, Cl. 209-138.000.

Johnson, Charles D.; and Droegemueller, James T., to Fairmont Railway Motors, Inc. Device for imbedding and removing elongated members. 3,709,464, Cl. 254-29.00r.

Johnson, David A.; and Wickersham, Arthur F., to Stanford Research Institute. Spark-gap triggering system. 3,710,178, Cl. 315-149.000.

Johnson, Donald G. Hair spraying apparatus. 3,709,438, Cl. 239-417.500.

Johnson, E. F., Company: *See—*
Swinehart, Frank, 3,710,040.

Johnson, Frederick W.: *See—*
Hagge, John K.; and Johnson, Frederick W., 3,710,251.

Johnson, Harry Joseph; Wolfelsperger, Robert O.; and Davis, Robert Edgar, to Federal Paper Board Company, Inc. Container forming machine. 3,709,114, Cl. 93-44.000.

Johnson, Jesse R., to AVM Corporation. Plug valve having a dual diaphragm three position actuator. 3,709,461, Cl. 251-58.000.

Johnson, Matthey & Co., Limited: *See—*
Selman, Gordon Leslie; and Darling, Alan Sidney, 3,709,667.

Johnson, Norman S., to Rex Chainbelt Inc. High strength adjustable quarter turn fastener. 3,709,086, Cl. 85-7.000.

Johnson, Robert A.: *See—*
Frymoyer, Edward M.; and Johnson, Robert A., 3,710,344.

Johnson, Rowland Edward; and Trachtenberg, Isaac, to Texas Instruments, Incorporated. Ion-selective electrochemical sensor. 3,709,813, Cl. 204-195.00g.

Johnson Service Company: *See—*
Thoma, Paul E.; and Hoffmann, frederick A., 3,708,863.

Johnson, Wayne E.; and Korb, Eugene V., to Allis-Chalmers Manufacturing Company. Vehicle weight mounting means. 3,709,520, Cl. 280-150.00e.

Johnson, Wayne O.: *See—*
Klemm, Le Roy H.; Johnson, Wayne O.; and White, Danny V., 3,709,894.
Klemm, Le Roy H.; Johnson, Wayne O.; and White, Danny V., 3,709,994.

Johnston, Richard W., to General Motors Corporation. Programmed commuting power source for inverter motor system. 3,710,215, Cl. 318-227.000.

Johswich, Friedrich; and Schindelbeck, Werner, to Chemiebau Dr. A. Zieren GmbH & Co. KG. Adsorption method and apparatus for treating polluted gas streams. 3,708,981, Cl. 55-73.000.

Jolly, Shelby A.: *See—*
Jackson, Arthur L.; Jolly, Shelby A.; and Quirk, John B., 3,710,144.

Jonason, Arne Holger; and Granlund, Gosta Holger, to Saab-Scania Aktiebolag. Method and arrangement for electronic control of the braking means of wheeled vehicles. 3,709,565, Cl. 303-21.0be.

Jones, David Henry: *See—*
Amin, Shirish Chandubhai; Jones, David Henry; and Maxwell, Donald Robert, 3,709,879.

Jones, Jack, to Cessna Aircraft Company. Aircraft hangar structure. 3,708,934, Cl. 52-237.000.

Jones, Lynn G., to Global Marine Inc. Thread protector for threaded pipe section ends or the like. 3,709,261, Cl. 138-96.00t.

Jones, Rexford W.; and Thompson, William B., to Staley, A. E., Manufacturing Company. Dye imbibition images. 3,709,688, Cl. 96-48.000.

Jones, Robert D., to Dow Chemical Company, The. Container feed mechanism for refuse incinerator. 3,709,386, Cl. 214-23.000.

Jones, Robert Henry. Switching control systems. 3,710,200, Cl. 317-134.000.

Jonnet, Albert G.: *See—*
Kinzler, Raymond C.; and Jonnet, Albert G., 3,709,387.

Jonsson, Per Hjalmar, to Rederiaktiebolaget Nordstjernan. Measuring vessel for photometric analysts of a liquid, in which gas bubbles are developed. 3,709,616, Cl. 356-246.000.

Jorges Carpet Mills, Inc.: *See—*
Greene, Mervin D., 3,709,173.

Josef, Muskat: *See—*
Auler, Herbert; and Josef, Muskat, 3,709,470.

Joseph, Bernard W.: *See—*
Donohue, Robert J.; and Joseph, Bernard W., 3,710,095.

Jubb, James R. Sunburn warning device comprising detecting the ultraviolet component of solar radiation. 3,710,115, Cl. 250-83.3uv.

Jullien-Davin, Jean, to Crouzet. Non-return, direction of rotation selecting device for synchronous motor. 3,710,155, Cl. 310-4.000.

Jung, Anton L.: *See—*
Hubert, Helmut; Jung, Anton L.; Lapczyna, Manfred; Ledwon, Erhard; Rock, Wilfried; and Schmidt-Burbach, Gerhard, 3,710,077.

Junga, Yan Petrovich: *See—*
Abramov, Viktor Petrovich; Junga, Yan Petrovich; Berzin, Gunard Valdemarovich; Skrupsky, Voldemar Petrovich; Frolov, Petr Nikolaevich; Lugovskoi, Andrei Lukyanovich; Shilgorin, Felix Alexandrovich; Dalbinsh, Yan Yanovich; Rotsen, Karl Arturovich; Ziemelis,Andris Eduardovich; Elksnis, Artur Yanovich; and Priede, Bruno Andreevich, 3,709,270.

Juraschek, Richard: *See—*
Kannegiesser, Herbert; and Juraschek, Richard, 3,709,348.

Jurasek, Jaromir; Mikac, Mojimar; and Podzimek, Karel, to Svit, narodni podnik. Method of manufacture waterproof shoes. 3,708,815, Cl. 12-142.00e.

Jurny, Josef: *See—*
Stepanek, Karel; and Jurny, Josef, 3,709,048.

Justice, James W. H., to Westinghouse Electric Corporation. Color television system. 3,710,014, Cl. 178-5.4st.

Kabushiki Kaisha Kanagawaseisakusho: *See—*
Amamiya, Ikuzou, 3,708,868.

Kabushiki Kaisha Kashifuji Tekkosho: *See—*
Ainoura, Masato, 3,708,925.

Kabushiki Kaisha Ricoh: *See—*
Sawada, Hideo; Rin, Ensei; Yamada, Isao; Mano, Hiroshi; and McGourty, Thomas K., 3,710,359.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See—*
Funaki, Takashi, 3,708,973.

Kabushiki Kaisha Suwa Seikosha: *See—*
Fujimori, Motoyuki, 3,708,974.

Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.): *See—*
Hayakawa, Osamu, 3,709,614.

Kacarb Products Corporation, mesne: *See—*
Orkin, Stanley S.; and Hartwick, Richard W., 3,709,573.

Kachergis, Henry J. Water inlet control means for toilet tanks. 3,709,246, Cl. 137-216.000.

Kaczmarek, Thomas S. Foldable golf cart. 3,709,514, Cl. 280-41.00c.

Kadar, Nicholas M., to Singer Company, The. Slideback peak circuits with constant tone indications. 3,710,249, Cl. 324-103.00p.

Kaganovsky, Gary Petrovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.

Kahn, Paul: *See—*
Edwards, William Sterling; Kahn, Paul; and Goodenough, Samuel H., 3,709,175.

Kaiser Steel Corporation: *See—*
Grimoldi, Ranoldo H., 3,709,024.

Kalle Aktiengesellschaft: *See—*
Kindl, Erwin; and Gerigk, Gunter, 3,709,720.

Kamada, Masaki; and Okauchi, Tetsuo, to Takeda Chemical Industries, Ltd. Method of inducing simultaneous mounting of silkworms. 3,709,990, Cl. 424-243.000.

Kaminsky, George J.; and Laughlin, Robert G., to Procter & Gamble Company, The. Preparation of dimethylhydroxylamine. 3,709,942, Cl. 260-583.0dd.

Kamio, Kenzo; and Miyoshi, Seizo, to Matsushita Electric Industrial Co., Ltd. Speed changing device for automatic record players. 3,709,503, Cl. 274-9.00a.

Kampe, Marcis M., to Enthone, Incorporated. Bright tin electrodepositing. 3,709,799, Cl. 204-54.00r.

Kamstrup-Larsen, Harry, to A/S Dansk Leca. Rotary kiln for the production of a granular, bloated product. 3,709,474, Cl. 263-32.00r.

Kanamaru, Hisanobu: *See—*
Ohuchi, Yasushi; Kanamaru, Hisanobu; and Honshima, Teruhisa, 3,708,872.

Kanebo, Ltd.: *See—*
Chiba, Yoshio, 3,708,837.

Kaneda, Yoko: *See—*
Sada, Tomohiko; Tsuchiya, Noriyuki; Amamiya, Tameo; Kaneda, Yoko; and Ohta, Kazuyuki, 3,710,195.

Kannegiesser, Herbert; and Juraschek, Richard, to Kannegiesser Maschinenfabrik Gesellschaft mit beschrankter Haftung. Glueing press for glueing flat shaped textile articles. 3,709,348, Cl. 198-19.000.

Kannegiesser Maschinenfabrik Gesellschaft mit beschrankter Haftung: *See—*
Kannegiesser, Herbert; and Juraschek, Richard, 3,709,348.

Kanzaki, Toshihiko; Nakatsui, Isamu; Sugiyama, Yoshio; Nishio, Masaaki; and Ishikawa, Michio, to Takeda Chemical Industries, Ltd. Producing L-glutamic acid. 3,709,787, Cl. 195-30.000.

Karabinos, Joseph V.; Leopold, Karl M.; and Doherty, William P., to Owens-Illinois, Inc. Process for lubricating vinyl polymers with sitosterol compounds and stabilized product thereof. 3,709,867, Cl. 260-28.50a.

Karapinka, George L.: *See—*
Karol, Frederick J.; and Karapinka, George L., 3,709,954.

Karapinka, George L., to Union Carbide Corporation. Polymerization of ethylene using supported bis-(cyclopentadienyl) chromium (II) catalysts. 3,709,853, Cl. 260-88.20d.

Karol, Frederick J.; and Karapinka, George L., to Union Carbide Corporation. Preparation of liquid polymers of olefins. 3,709,954, Cl. 260-683.15d.

Karp, Joseph G., Jr.; and McCurdy, Robert F., to American Standard, Inc. Movable wall panel systems. 3,708,916, Cl. 49-409.000.

Karpov, Vladimir Lvovich: *See—*
Lukhovitsky, Vladimir Isaakovich; Smirnov, Andrei Mikhailovich; Polikarpov, Vladimir Vasilievich; Lebedeva, Alla Mikhailovna; Laguchcva, Raisa Mizovna; and Karpov, Vladimir Lvovich, 3,709,804.

Karstendiek, Claude A.: *See—*
Wright, Robert J.; Chapin, John S.; Mah, George; and Karstendiek, Claude A., 3,709,809.

Karstensen, Karl W.; Koch, James M.; and Hoftiezer, Wallace A., to Caterpillar Tractor Company. Turbine blade seal arrangement. 3,709,631, Cl. 416-95.000.

Kashihara, Hideo: *See—*
Deguchi, Yutaka; Kashihara, Hideo; Koozuki, Rikuzo; Takahashi, Kazuyoshi; and Ikeda, Mitsuyuki, 3,708,962.

Kasper, Werner: *See—*
Goetze, Walter; Kasper, Werner; Klatt, Gerhard; and Schulz, Gerhard, 3,709,945.

Kaszuba, Robert J., to Pettibone Corporation. Grinding machine. 3,708,920, Cl. 51-32.000.

Katerndahl, Dean R.: *See—*
Macalalad, Fidel Villaluna; and Katerndahl, Dean R., 3,709,223.

Kato, Jinichi; and Shimizu, Toshiharu, to Nippon Kogaku K.K. Device for adjusting angle of inclination of reference mirror for interferometer. 3,709,606, Cl. 356-109.000.

Kato, Takeaki: *See—*
Matsui, Masanao; Kato, Takeaki; Ueda, Kenzo; Mizutani, Toshio; Kitamura, Shigeyoshi; Fujimoto, Keimei; and Okuno, Yositosi, 3,709,910.

Katsevich, Leonid Savvich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.

Katsuragawa Denki Kabushiki Kaisha: *See—*
Furuichi, Masayoshi, 3,709,603.

Katz, Martin B.: *See—*
Jackson, Charles A.; and Katz, Martin B., 3,709,263.

Kaufeldt, Roland T. A. Robot system. 3,709,379, Cl. 214-1.0bb.

Kauffman, Robert J., to Narad, Inc. Honeycomb pallet. 3,709,161, Cl. 108-51.000.

Kaufman, Peter: *See—*
Colsen, Frank Thomas; Kaufman, Peter; and Townsend, Robert L., 3,710,317.

Kaupick, Walter J.; and Cimera, Richard F., to Singer Company, The. Universal joint flexure assembly. 3,709,045, Cl. 74-5.00f.

Kawai, Shinji: *See—*
Miyake, Hirotaka; and Kawai, Shinji, 3,709,568.

Kawakubo, Kazuo; and Kurahashi, Akira, to Canon Kabushiki Kaisha. Copying machine. 3,709,592, Cl. 355-8.000.

Kawano, Shigeru: *See—*
Watanabe, Seizi; Ozaki, Kozo; Oishi, Hiroshi; Aoki, Fumio; and Kawano, Shigeru, 3,710,373.

Kawashima, Yoshichi; and Mitsueda, Hisami, to Nippon Denso Kabushiki Kaisha. Flasher for vehicles. 3,710,183, Cl. 315-209.000.

Kawatani, Shigeo: *See—*
Mori, Kan; Imaizumi, Fumitake; Sato, Hisaya; Nagaoka, Isao; Hirayanagi, Shigetoshi; Shibata, Toru; and Kawatani, Shigeo, 3,709,851.

Kawazoe, Shiro: *See—*
Tani, Kaneyasu; Kawazoe, Shiro; Eto, Mikio; Okamots, Sunao; and Fujino, Tamotsu, 3,709,691.

Kawazoe, Toshinobu, to Nippon Denzai, Ltd. Stretched fuse device. 3,710,297, Cl. 337-290.000.

Kayano, Yosiro: *See—*
Miwa, Osamu; and Kayano, Yosiro, 3,710,349.

Kazaoka, Kenichi; and Torii, Nozomu, to Aisin Seiki Kabushiki Kaisha. Door locking device. 3,709,537, Cl. 292-216.000.

Keating, Esmond J.; Haydel, Chester H.; and Knoepfler, Nestor B., to United States of America, Agriculture. Vapor-phase reaction apparatus for treating cellulosic textile materials and garments. 3,709,005, Cl. 68-6.000.

Keenan, Peter P., to Lockheed Aircraft Corporation. Microwave gage for monitoring thickness of a conductive workpiece, flaws therein or displacement relative thereto. 3,710,243, Cl. 324-58.50b.

Keester, Kenneth L.: *See—*
Jacobs, John T.; Keester, Kenneth L.; and Silverman, Benjamin D., 3,710,353.

Keever, Joseph M.: *See—*
Clay, Joe D.; and Keever, Joseph M., 3,710,245.

Kehn, John T.: *See—*
Gerstin, Jeffrey M.; and Kehn, John T., 3,709,848.

Keifer, John N., to Indiana Metal Treating, Inc. Process for repairing worn and deformed railway frogs. 3,708,856, Cl. 29-401.000.

Keller, Arnold: *See—*
Pohl, Fritz G.; and Keller, Arnold, 3,709,630.

Kelly, Austin T., to Weston Instruments, Inc. Dual-slope analog-to-digital converter wherein two analog input signals are selectively integrated with respect to time. 3,710,374, Cl. 340-347.0nt.

Keltie, Dale A.: *See—*
Oxendine, Joseph W., Jr.; Happs, Gary J.; and Keltie, Dale A., 3,710,105.

Kemper, James M., to Monogram Industries, Inc. Filter and pump for a recirculating sanitary system. 3,708,806, Cl. 4-10.000.

Kendall Company, The: *See—*
Hammond, Fred H., Jr., 3,709,808.

Kennecott Copper Corporation: *See—*
Corrigan, Donald A.; Servi, Italo S.; and Wang, Chih-Chung, 3,709,722.

Kenyon, Fred V., to Robertshaw Controls Company. Thermocouple. 3,709,740, Cl. 136-217.000.

Kershaw, Stanley S., Jr.: *See—*
Marek, James R.; and Kershaw, Stanley S., Jr., 3,710,212.

Kessler, Claus; and Kohler, Werner, to Siemens Aktiengesellschaft. Cable terminal for high voltage cables. 3,710,247, Cl. 324-96.000.

Kessler, Hartmut: *See—*
Behn, Reinhard; Gottlob, Heinrich; Hoyler, Gerhard; and Kessler, Hartmut, 3,710,211.

Kidd, Mathew. Serving tray construction with adjustable clamp means. 3,709,158, Cl. 108-43.000.

Kidde, Walter, & Company, Inc., mesne: *See—*
Sterner, Russell L., 3,708,937.

Kieley & Mueller, Inc.: *See—*
O'Connor, Joseph, Jr., 3,709,245.

Kiffmeyer, William W.: *See—*
Radtke, Joseph D.; and Kiffmeyer, William W., 3,710,378.

Kiisk, Allan. Range change method of determining positions. 3,710,331, Cl. 343-112.00r.

Kikkoman Shoyu Co., Ltd.: *See—*
Okuhara, Akira; Nakajima, Takashi; and Saito, Nobuo, 3,709,802.

Kilcullen, Robert. Occupant propelled coaster. 3,709,515, Cl. 280-87.02w.

Kilgore, Marion D., to Camco, Incorporated. Downhole power dissipator. 3,709,294, Cl. 166-243.000.

Killinger, Gordon B.; and Beckham, Clarence F., to Institute of Food and Agriculture Sciences, The. Beverage from plants of the genus hemorthria. 3,709,694, Cl. 99-28.000.

Kimball, Pleasent P.; Hagey, Robert H.; and Macaulay, Malcolm J. Emergency warning systems. 3,710,313, Cl. 340-33.000.

Kimberly-Clark Corporation: *See—*
Burger, William H., 3,708,831.
Laumer, Edward P., 3,709,095.
Minshell, Herman G., 3,709,750.
Stumpf, Robert J., 3,709,768.
Thomas, Gordon D., 3,709,764.

Kimmel, George T., III. Direct fluid energy transfer. 3,708,961, Cl. 55-261.000.

Kimmel, Milton J.: *See—*
Andrews, Douglas R.; and Kimmel, Milton J., 3,710,323.

Kimura, Shiro G., to General Electric Company. Preparation of asymmetric polymer membranes. 3,709,774, Cl. 164-159.000.

Kindl, Erwin; and Gerigk, Gunter, to Kalle Aktiengesellschaft. Process and apparatus for coating a tube of fiber material with viscose by extrusion. 3,709,720, Cl. 117-95.000.

King, James Ping, to Pennwalt Corporation. Heat and abrasion resistant textiles. 3,709,721, Cl. 117-104.00r.

King, James R., Jr.: *See—*
Cohen, Hyman L.; King, James R., Jr.; and Minsk, Louis M., 3,709,690.

King, Karl Lewis; and Arrington, James R., to American Limnetics Instruments, Inc. Method of using self-compensating electrode system. 3,709,796, Cl. 204-1.00t.

King, Lawrence H.: *See—*
Grubb, Willard T.; and King, Lawrence H., 3,709,810.

King, Stanley; and Tierney, Peter R., to Singer Company, The. Signal-to-noise detector for non-stabilized doppler radar. 3,710,381, Cl. 343-8.000.

Kingma, Wouter G., to Continental Engineering. Production of crystalline dextrose monohydrate. 3,709,731, Cl. 127-58.000.

Kinross, John, to Lancer Boss Limited. Lifting apparatus. 3,709,392, Cl. 214-620.000.

Kinzler, Raymond C.; and Jonnet, Albert G. Apparatus for handling lids and charging coal into coke ovens. 3,709,387, Cl. 214-35.00r.

Kinzler, Raymond C.; Edgar, William D.; and Sustarsic, John D., to Koppers Company, Inc. Coke oven machinery door extractor shroud. 3,709,794, Cl. 202-248.000.

Kirby, Robert A.; and Propst, Billy J., to Esso Production Research Company. Electrical amplifying apparatus for electrical signals of progressively decaying average amplitude. 3,710,259, Cl. 325-187.000.

Kirk, Frederick Arthur: *See—*
Hibbert, Charles; Kirk, Frederick Arthur; Siddall, Keith; and Howard, Michael Roi, 3,709,628.

Kiser, Fred W.: *See—*
Rhine, Wallace R.; and Kiser, Fred W., 3,708,817.

Kish, Edward E.: *See—*
Obergefell, Ronald F.; and Kish, Edward E., 3,709,433.

Kisling, James W., III. Mechanical jar. 3,709,478, Cl. 267-137.000.

Kissell, Ronald E.; and Gambill, Ulysses T., to Owens-Corning Fiberglas Corporation. Method and apparatus for subdividing a body of fibers into sections. 3,709,076, Cl. 83-42.000.

Kissinger, Richard D.: *See—*
Hirt, Thomas J.; Kissinger, Richard D.; and Frantzen, Karl H., 3,710,070.

Kistner, Hermann. Sheet feeding and aligning table. 3,709,484, Cl. 271-49.000.

Kitai, Kiyoshi. Lens shutter for a single lens reflex camera. 3,709,134, Cl. 95-60.000.

Kitamura, Shigeyoshi: *See—*
Matsui, Masanao; Kato, Takeaki; Ueda, Kenzo; Mizutani, Toshio; Kitamura, Shigeyoshi; Fujimoto, Keimei; and Okuno, Yositosi, 3,709,910.

Kitamura, Yoshihiro: *See—*
Fujio, Yoshio; Kitamura, Yoshihiro; Mihara, Koji; and Hamada, Tsuneakira, 3,710,016.

Kitzner, Ernest W.; and Rhodes, Alex, to Ford Motor Company. Energy absorbing steering column assembly. 3,709,057, Cl. 74-492.000.

Kiyotake, Takeshi: *See—*
Hano, Masaaki; Kiyotake, Takeshi; and Oike, Minoru, 3,709,423.

Klapes, Michael C.; and Macrae, Herbert N., to Delta Engineering Corporation. Parts conveyor. 3,709,385, Cl. 214-17.00c.

Klatt, Gerhard: *See—*
Goetze, Walter; Kasper, Werner; Klatt, Gerhard; and Schulz, Gerhard, 3,709,945.

Klauke, Erich: *See—*
Neeff, Rutger; and Klauke, Erich, 3,709,916.

Klehm, William G., Jr., to Burroughs Corporation. Vacuum-heat treatment of printed circuit boards. 3,708,876, Cl. 29-625.000.

Kleine-Doepke, Wolfgang: *See—*
Gruber, Wilhelm; Kleine-Doepke, Wolfgang; Quis, Peter; and Schroeder, Guenther, 3,709,934.

Kleiner, Hans-Jerg: *See—*
Gordon, Wolfgang; Kleiner, Hans-Jerg; and Van Spankeren, Ulrich, 3,709,852.

Klementz, Peter; Massat, Heinz; Nitschke, Christoph; and Haubold, Herbert. Thread guide roller. 3,708,969, Cl. 57-55.500.

Klemm, Le Roy H.; Johnson, Wayne O.; and White, Danny V., to Research Corporation, mesne. Thieno (3,4-b) pyridine and thieno (3,4-c) pyridine. 3,709,894, Cl. 260-294.80c.

Klemm, Le Roy H.; Johnson, Wayne O.; and White, Danny V., to Research Corporation, mesne. Thieno (3,4-b) pyridine and thieno (3,4-c) pyridine. 3,709,994, Cl. 260-294.80c.

Klessmann, Gunther: *See—*
Boden, Heinrich; Breer, Karl; Klessmann, Gunther; and Knipp, Ulrich, 3,709,640.

Klettke, Walter G., to Upjohn Company, The. Syringe assembling method and machine. 3,708,945, Cl. 53-22.000.

Klevgard, Glenn A., to Domain Industries. Article-release shackle for trolley-supported handling systems to facilitate processing. 3,708,829, Cl. 17-11.000.

Klobas, Ivan. Centrifugal casting machine. 3,709,287, Cl. 164-292.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Howe, Hans-Ulrich, 3,709,109.

KMS Industries, Inc., mesne: *See—*
Rhodes, Barry V.; and Bloxsom, Daniel E., 3,709,026.

Knell, Martin: *See—*
Dexter, Martin; Knell, Martin; and Brunetti, Heimo, 3,709,883.

Knicely, David R.: *See—*
Looker, Olin L.; Zemke, Frederick A.; Knicely, David R.; Rouse, Russell V.; and Slates, Larry L., 3,709,231.

Knipp, Ulrich: *See—*
Boden, Heinrich; Breer, Karl; Klessmann, Gunther; and Knipp, Ulrich, 3,709,640.

Knoepfler, Nestor B.: *See—*
Keating, Esmond J.; Haydel, Chester H.; and Knoepfler, Nestor B., 3,709,005.

Knyazhinsky, Zakhar Osipovich: *See—*
Raichuk, Jury Isaakovich; Knyazhinsky, Zakhar Osipovich; Mandelberg, Simon Lvovich; Lebedev, Vladimir Konstantinovich; and Volkov, Viktor Nikolaevich, 3,710,066.

Kobayashi, Hisanori: *See—*
Suda, Toshi; Kobayashi, Hisanori; and Nagata, Senichi, 3,709,639.

Kobayashi, Kengo; and Manabe, Mitsuo, to Fujitsu Limited. Signal transmission system. 3,710,363, Cl. 340-213.000.

Kobylinski, Lech; Krezelewski, Mieczyslaw; Brzoska, Edmund; and Krenicki, Witold. Hydrofoil craft. 3,709,180, Cl. 114-66.50h.

Koch, A. Richard, to Barber-Colman Company. Motor speed regulation. 3,710,220, Cl. 318-328.000.

Koch, James M.: *See—*
Karstensen, Karl W.; Koch, James M.; and Hoftiezer, Wallace A., 3,709,631.

Kodama, Hisashi; Sekigawa, Tsuneo; Hata, Kazumi; and Nakaya, Akimichi, to Nippon Kokan Kabushiki Kaisha. Brackets for supporting partitions in docks. 3,708,989, Cl. 61-64.000.

Kodama, Takashi: *See*—
Takikawa, Toshio; Satomo, Kouji; and Kodama, Takashi, 3,709,777.

Koeblitz, William E., to Gould Inc., mesne. Multichannel electrocardiograph having one less input amplifiers than the number of signals to be measured. 3,709,212, Cl. 128-2.06b.

Koehring-Waterous, Ltd.: *See*—
Kurelek, John, 3,709,267.

Koenig, Martin F.; De Backer, Frank A.; and Issa, Manuel; deceased (by Sheedy, Patrick T.; administrator), to Cutler-Hammer, Inc. Clamping adjustment feature for bus duct housing. 3,710,300, Cl. 339-22.00b.

Koenig, Robert H., to Tapeswitch Corporation of America. Ribbon switch means. 3,710,054, Cl. 200-86.00r.

Koeplinger, Ronald D.; Pashak, John F.; and Foerster, George S., to Dow Chemical Company, The. Thermal process for improving the mechanical forming of magnesium alloys. 3,709,745, Cl. 148-11.50m.

Koga, Masashi: *See*—
Aizu, Keiichiro; Kumada, Akio; and Koga, Masashi, 3,710,286.

Kogyo Gijutsuin; a/k/a Industrial Science and Technology, Agency of: *See*—
Hayashi, Tutaka; and Tarui, Yasuo, 3,710,041.

Kohashi, Tadao: *See*—
Tanaka, Kazunobu; Machida, Yasuhiko; Suzuki, Norio; and Kohashi, Tadao, 3,710,181.

Kohashi, Tadao; Nakamura, Tadao; and Nakamura, Shigeaki, to Matsushita Electric Industrial Co., Ltd. Solid-state image converter having composite energy sensing element. 3,710,127, Cl. 250-213.00r.

Kohler, Werner: *See*—
Kessler, Claus; and Kohler, Werner, 3,710,247.

Kohlhaupt, Reinhold; and Becke, Friedrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of 5-methylene-2,4-oxazolidinediones. 3,709,895, Cl. 260-307.00b.

Kohlstrunk, Arthur T., to Abrasive Diamond Tool Company. Diamond dressing tool. 3,709,207, Cl. 125-11.000.

Kohtani, Yutaka, to Canon Kabushiki Kaisha. Anti-crosstalk system for multi-track multiple head device with longitudinally spaced head means, shielding cases for each head means, and an erase head placed between each head means. 3,710,036, Cl. 179-100.20k

Koide, Hideo, to Rhythm Watch Company, Limited. Correcting mechanism of date- and day-indications in leaf-type clock. 3,708,972, Cl. 58-6.00r.

Kojabashian, Charles: *See*—
Ribich, William A.; Kojabashian, Charles; and Girard, Lauret H., 3,708,833.

Kolbe, Andreas: *See*—
Dobler, Johann; Hausner, Leopold; Kolbe, Andreas; and Tittus, Hans, 3,709,649.

Koll, Roman: *See*—
Hell, Rudolf; Koll, Roman; and Lifferth, Ewald, 3,710,019.

Koller, Stefan, to Ciba-Geigy AG. Dispersible phenyl-azo-phenyl dyestuffs. 3,709,872, Cl. 260-207.l00.

Kolmar, Herbert, to Impex-Essen Vertrieb von Werkzeugen GmbH. Cartridge-actuated fastener-driving tools. 3,709,421, Cl. 227-10.000.

Kondo, Eiji; Mitsugi, Takashi; and Tori, Kazuo, to Shionogi & Co., Ltd. Biochemical aldosterone synthesis. 3,709,789, Cl. 195-51.00r.

Kondo, Tetsuya: *See*—
Ikeda, Hironosuke; and Kondo, Tetsuya, 3,710,201.

Kondo, Toshio; and Tamura, Hifumi, to Hitachi, Ltd. Ion source device for ion microanalyzer and the like. 3,710,266, Cl. 328-233.000.

Kondo, Toshiyuki; and Kozakai, Asao, to Aisin Seiki Kabushiki Kaisha. Wheel brake assembly fitted with automatic brake cap adjusting means. 3,709,334, Cl. 188-79.50p.

Kono, Masaru: *See*—
Yabe, Masaya; Takahama, Teizo; Kono, Masaru; and Hirono, Katsumi, 3,710,208.

Konomu, Kato: *See*—
Kunichika, Sango; Sakaibara, Yasumasa; Kyotofu, Noguchi; Akio, Kurisaki; Konomu, Kato; and Uchiyama, Mitsuru, 3,709,927.

Kontz, Robert F., to Owens-Illinois, Inc. Hydraulic powered bottle crusher. 3,709,440, Cl. 241-36.000.

Koozuki, Rikuzo: *See*—
Deguchi, Yutaka; Kashihara, Hideo; Koozuki, Rikuzo; Takahashi, Kazuyoshi; and Ikeda, Mitsuyuki, 3,708,962.

Koppers Company, Inc.: *See*—
Kinzler, Raymond C.; Edgar, William D.; and Sustarsic, John D., 3,709,794.

Korb, Eugene V.: *See*—
Johnson, Wayne E.; and Korb, Eugene V., 3,709,520.

Kossuth, Donald A.; and Shull, John D., to National Gypsum Company. Simulated monolithic predecorated wall construction. 3,708,935, Cl. 52-416.000.

Kovac, Michael G.: *See*—
Jacobs, John E.; and Kovac, Michael G., 3,710,125.

Kozakai, Asao: *See*—
Kondo, Toshiyuki; and Kozakai, Asao, 3,709,334.

Kozlow, Edward: *See*—
Hardt, Robert C.; and Kozlow, Edward, 3,708,993.

Kraftco Corporation: *See*—
Luck, Raymond T., 3,709,371.

Kramatorsky Nauchno-Issledovatelski i Proektno-tekhnologichesky institut mashinostroenia: *See*—
Isaev, Alexei Ilich; Pevzner, Semen Albertovich; and Zemtsov, Jury Semenovich, 3,708,919.

Krauch, Carl Heinrich; and Sanner, Axel, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of polymers with a fibrous structure. 3,709,805, Cl. 204-159.220.

Kravitz, Stanley: *See*—
Suggitt, Robert M.; Estes, John H.; and Kravitz, Stanley, 3,709,817.

Krehel, John J., Jr.: *See*—
Thomas, George E.; and Krehel, John J., Jr., 3,708,943.

Kreinheder, Donald E., to Hughes Aircraft Company. Monopulse switching system. 3,710,390, Cl. 343-16.00m.

Kreitz, Richard W.; and Svendsen, John A., to Minnesota Mining and Manufacturing Company. Development device. 3,709,472, Cl. 263-6.00e.

Krekeler, Jerome H.; Wehr, Charles H.; and Aboutboul, Henri A., to National Petro-Chemicals Corporation. High shear mixing apparatus for making silica gels. 3,709,664, Cl. 23-285.000.

Krenicki, Witold: *See*—
Kobylinski, Lech; Krezelewski, Mieczyslaw; Brzoska, Edmund; and Krenicki, Witold, 3,709,180.

Krezelewski, Mieczyslaw: *See*—
Kobylinski, Lech; Krezelewski, Mieczyslaw; Brzoska, Edmund; and Krenicki, Witold, 3,709,180.

Krimmel, Carl Peter, to Searle, G. D., & Co. Amides of hexahydro-4,7-methanoindan-2-carboxylic acid. 3,709,937, Cl. 260-557.00b.

Krombein, Norman A. Movable targets and variable angle projector. 3,709,495, Cl. 273-101.000.

Kromer, George L. Vehicle electrical combination lock. 3,710,316, Cl. 340-63.000.

Kronfeld, Alan C.; and Michael, Paul S., to Nortronics Company, Inc. Hand held transducer insensitive to angular orientation. 3,710,362, Cl. 340-174.10f.

Kruegle, Herman A., to Holobeam, Inc. Method and apparatus for measuring and controlling the thickness of a filament or the like. 3,709,610, Cl. 356-160.000.

Kubisiak, Helmut, to Exatest Messtechnik GmbH. Method and device for photoelectrically scanning an object by means of an optical beam. 3,710,128, Cl. 250-219.0wd.

Kubota, Yasuharu, to Sony Corporation. Single tube color television camera with indexing means. 3,710,013, Cl. 178-5.4st.

Kuehn, Erich: *See*—
Feltzin, Joseph; Kuehn, Erich; and Rudkin, George O., Jr., 3,709,684.

Kuehnemann, Karl; and Turban, Josef, to Siemens Aktiengesellschaft. Circuit arrangement for the detection of faults or points on inhomogeneous electric lines or cables according to the impulse reflection method utilizing an adjustable balancing network. 3,10,240, Cl. 324-52.000.

Kuhn, Edmund W., to Westinghouse Electric Corporation. Electric switch having improved electrically conducting hinge structure. 3,710,059, Cl. 200-166.00c.

Kuhn, Hans-Ulrich, to Daimler-Benz Aktiengesellschaft. Monitoring installation of the lighting system of motor vehicles. 3,710,364, Cl. 340-214.000.

Kuhn, Max: *See*—
Lampart, Thomas; Scheidweiler, Andreas; and Kuhn, Max, 3,710,110.

Kuhnlein, Hans, to Hch. Bertrams Aktiengesellschaft. Apparatus for the production of blocks from sodium hydroxide solution. 3,709,648, Cl. 425-224.000.

Kuipers, Egbert; Gunnewig, Paul; and Menz, Horst, to Hartmann & Braun Aktiengesellschaft. Polarized electromagnetic relay. 3,710,290, Cl. 335-230.000.

Kukucka, William P.: *See*—
Turner, Lyman H.; Kukucka, William P.; and Summers, James E., 3,709,595.

Kulka, Marshall: *See*—
Von Schmeling, Bogislav; Harrison, William A.; and Kulka, Marshall, 3,709,992.

Kumada, Akio: *See*—
Aizu, Keiichiro; Kumada, Akio; and Koga, Masashi, 3,710,286.

Kunichika, Sango; Sakaibara, Yasumasa; Kyotofu, Noguchi; Akio, Kurisaki; Konomu, Kato; and Uchiyama, Mitsuru, to Idemitsu Kosan co., Ltd. Method for preparing methacrylic acid ester. 3,709,927, Cl. 260-486.0ac.

Kunz, Bernard P. Speed regulating system. 3,709,416, Cl. 226-2.000.

Kurahashi, Akira: *See*—
Kawakubo, Kazuo; and Kurahashi, Akira, 3,709,592.

Kurelek, John, to Koehring-Waterous, Ltd. Log handling mechanism for tree harvesters. 3,709,267, Cl. 144-2.00z.

Kuroda, Kotofusa: *See*—
Fujimoto, Tadasu; Kuroda, Kotofusa; and Yamamoto, Akira, 3,709,737.

Kurtz, Robert L. Laminated wrench. 3,709,073, Cl. 81-119.000.

Kusuhara, Masaki, to Wacom Ltd. Process for dyeing and finishing fibrous material. 3,709,656, Cl. 8-17.000.

Kusuhara, Masaki, to Wacom Ltd. Process for dyeing and finishing fibrous material. 3,710,656, Cl. 8-17.000.

Kusui, Shoji, to Nihon Denki Keiki Kenteisho. Diode watthourmeter. 3,710,254, Cl. 324-142.000.

Kyotofu, Noguchi: *See*—
Kunichika, Sango; Sakaibara, Yasumasa; Kyotofu, Noguchi; Akio, Kurisaki; Konomu, Kato; and Uchiyama, Mitsuru, 3,709,927.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Fujimoto, Yasuo, 3,709,873.
Nakayama, Kiyoshi, 3,709,786.
Tanaka, Katsunobu; Suzuki, Takeo; Yamaguchi, Ken; and Yamamoto, Masaki, 3,709,783.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See*—
Samejima, Hirotoshi; Furuya, Akira; Shimaoka, Keiji; and Aoki, Yoshiatsu, 3,709,701.

La Rocca, Salvatore, to Polaroid Corporation. Camera accessory for photographing print. 3,709,597, Cl. 355-61.000.

Labadie, Paul A., to Farr Company. Exhaust filter unit and method of filtering exhaust. 3,708,957, Cl. 55-36.000.

Lacey, Marrick T. Protective telephone alarm system. 3,710,024, Cl. 179-5.00p.

Lafferty, John J.; and Zirkle, Charles L., to Smith Kline & French Laboratories. N-Thienylalkyl-β-alkoxy-trifluoromethylphenalkylamines. 3,709,913, Cl. 260-332.30r.

Lager, Sam E.: *See*—
Cettin, Edward J.; Pappas, Jimmy P.; and Lager, Sam E., 3,709,203.

Laggy, William Joseph; and May, Harold Frederick, to Bell Telephone Laboratories, Incorporated. Time slot memory circuit. 3,710,025, Cl. 179-15.00a.

Lagucheva, Raisa Mizovna: *See*—
Lukhovitsky, Vladimir Isaakovich; Smirnov, Andrei Mikhailovich; Polikarpov, Vladimir Vasilievich; Lebedeva, Alla Mikhailovna; Lagucheva, Raisa Mizovna; and Karpov, Vladimir Lvovich, 3,709,804.

Lahde, Reinhard N.; and Pawelek, Alex, to Lockheed Aircraft Corporation. Servo system employing switching type feedback. 3,710,086, Cl. 235-150.200.

Laing, Nikolaus. Rotating electric machine with evaporation cooling. 3,710,156, Cl. 310-54.000.

Lally, Joseph Edward, to Bally Manufacturing Corporation. Race game and chance programming apparatus therefor. 3,709,493, Cl. 273-86.00f.

Lamb, Edward Lawrence; McAinsh, Kenneth Gordon; and Smith, Ralph David, to Smiths Industries Limited. Head-up display apparatus. 3,709,589, Cl. 353-13.000.

Lambda Electronics Corporation: *See*—
Greenberg, Sol; Gold, Robert D.; and Projain, Richard J., 3,710,193.

Lampart, Thomas; Scheidweiler, Andreas; and Kuhn, Max, to Cerberus AG. Ionization fire alarm device with shielding for its electrical circuitry. 3,710,110, Cl. 250-83.6et.

Lancer Boss Limited: *See*—
Kinross, John, 3,709,392.

Land, Edwin H., to Polaroid Corporation. Motion picture system with unique projector and method. 3,709,588, Cl. 352-78.00r.

Land, Edwin H., to Polaroid Corporation. Diffusion transfer receiving element with varing concentration of precipitating nuclei. 3,709,687, Cl. 96-29.00l.

Land Pyromters Limited: *See*—
Coe, Charles David, 3,709,040.

Landa, Torstein; Syvakari, Pertti; and Westman, Erik, to Allmanna Svenska Elektriska Aktiebolaget. Press for hydrostatic extrusion. 3,709,014, Cl. 72-60.000.

Landgraf, Karl: *See*—
Hollerl, Alois; and Landgraf, Karl, 3,709,320.

Landis, Franklin F.: *See*—
Michel, Donald P.; Steinige, Herman; Landis, Franklin F.; and Skeen, Lawrence, 3,709,443.

Laney, Henry J. Method and apparatus for cleaning vessels afloat. 3,709,184, Cl. 114-222.000.

Lang, Arnold: *See*—
Ambros, Rafael Foguet; Beerwald, Alexander; and Lang, Arnold, 3,708,955.

Lang, John M.: *See*—
Watts, John F.; Lang, John M.; Simonson, Alden D.; and Nomura, Raymond S., 3,709,450.

Lange, Karl Heinz: *See*—
Langewiesche, Wilhelm; and Lange, Karl Heinz, 3,709,120.

Lange, Karl-Heinz, to Balda-Werke. Camera with retractable objective. 3,709,129, Cl. 95-39.000.

Langewiesche, Wilhelm; and Lange, Karl Heinz, to Balda Werke Photographische Gerate und Kunststoff R. Gruter Kommanditgesellschaft. Photographic camera having a mutual film-transport and exposure lock. 3,709,120, Cl. 95-11.00r.

Lanz, Renato: *See*—
Cogliati, Guido; Recrosio, Agostino; and Lanz, Renato, 3,709,963.

Lapczyna, Manfred: *See*—
Hubert, Helmut; Jung, Anton L.; Lapczyna, Manfred; Ledwon, Erhard; Rock, Wilfried; and Schmidt-Burbach, Gerhard, 3,710,077.

Laporte Industries Limited: *See*—
Lee, Stephen Arthur; Cardy, Charles Frederick; and Sampson, Keith George, 3,709,981.

Larsen, Eric R.: *See*—
Edamura, Fred Y.; McKendry Lennon H.; and Larsen, Eric R., 3,709,926.

Larson, Donald A., to Hartzell Manufacturing, Inc. Adjustable hydraulic door closure. 3,708,826, Cl. 16-52.000.

Larsonneur, Louis C., to Nalco Chemical Company. Hot rolling mill lubrication apparatus and process. 3,709,012, Cl. 72-21.000.

Laser Electronics Pty., Ltd.: *See*—
Walden, Noel Harry Fred, 3,710,098.

Lassanske, George G., to Outboard Marine Corporation. Variable speed power transmission with snap-in clutch. 3,709,052, Cl. 74-230.17e.

Last, Walter A., to Peck & Hale, Inc. Tie down device. 3,709,455, Cl. 248-361.00a.

Latash, Jury Vadimovich: *See*—
Medovar, Boris Izrailevich; Popov, Viktor Andreevich; Alferov, Jury Fedorovich; Bogachenko, Alexey Georgievich; and Latash, Jury Vadimovich, 3,709,997.
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.

Lau Incorporated: *See*—
Beehler, Richard F., 3,708,999.
Beehler, Richard F., 3,709,531.

Laughlin, Robert G.: *See*—
Kaminsky, George J.; and Laughlin, Robert G., 3,709,942.

Laumer, Edward P., to Kimberly-Clark Corporation. Core slotting device. 3,709,095, Cl. 90-11.00c.

Laurencin, Marcel, to Cegedur GP. Method and apparatus for feeding high speed presses. 3,709,025, Cl. 72-421.000.

Lauterbach, Heinrich, to Trola-Kunststofferzeugnisse Gesellschaft mit Beschrankter Haftung & Co. Casings for a roller or bolt in a sliding door fitting. 3,709,541, Cl. 292-337.000.

Laux, Leon E., to Martin-Marietta Corporation. Method of cutting low density materials and improved cutter employed therewith. 3,709,094, Cl. 90-11.00c.

Lawrence Brothers, Inc.: *See*—
Foltz, Robert E., 3,708,827.

Lawrence, Derek R.: *See*—
Edgar, Owen Burchell; Hughes, William; Lawrence, Derek R.; Lederer, Gerald; and Ritchie, Colin Foster, 3,709,710.

Lawyer, John F.; and Prugger, David K., to General Electric Company. Resonator chamber silencer for gas turbine. 3,709,319, Cl. 181-33.0hb.

Layne & Bowler Company, The: *See*—
Layne, Leslie A., II; and Gerwick, Fred W., 3,709,293.

Layne, Leslie A., II; and Gerwick, Fred W., to Layne & Bowler Company, The. Wire wrapped well screen. 3,709,293, Cl. 166-232.000.

Lazor, George, to Westinghouse Electric Corporation. Insulating member for transformer coils. 3,710,293, Cl. 336-198.000.

Lebedev, Vladimir Konstantinovich: *See*—
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.
Raichuk, Jury Isaakovich; Knyazhinsky, Zakhar Osipovich; Mandelberg, Simon Lvovich; Lebedev, Vladimir Konstantinovich; and Volkov, Viktor Nikolaevich, 3,710,066.

Lebedeva, Alla Mikhailovna: *See*—
Lukhovitsky, Vladimir Isaakovich; Smirnov, Andrei Mikhailovich; Polikarpov, Vladimir Vasilievich; Lebedeva, Alla Mikhailovna; Lagucheva, Raisa Mizovna; and Karpov, Vladimir Lvovich, 3,709,804.

Lederer, Gerald: *See*—
Edgar, Owen Burchell; Hughes, William; Lawrence, Derek R.; Lederer, Gerald; and Ritchie, Colin Foster, 3,709,710.

Leduc, Robert D.: *See*—
Blinow, Igor; and Leduc, Robert D., 3,709,122.

Ledwon, Erhard: *See*—
Hubert, Helmut; Jung, Anton L.; Lapczyna, Manfred; Ledwon, Erhard; Rock, Wilfried; and Schmidt-Burbach, Gerhard, 3,710,077.

Lee, H. D., Company, Inc., The: *See*—
Sylvester, Willard G.; Boynton, Ira D.; and Bode, Robert H., 3,709,418.

Lee, Martin David, to Plessey Handel und Investments A.G. Transistor switches for high voltage applications. 3,710,147, Cl. 307-246.000.

Lee, Maw-Heul, 20% to Powell, B. J. Telephone silencing apparatus and method. 3,710,032, Cl. 179-84.00l.

Lee, Raymond, Organization, Inc., The: *See*—
Coby, Arnold, 3,709,500.
Matthews, Bernard John, 3,709,430.

Lee, Shih-Ying; and Li, Yao Tzu. Capacitance accelerometer. 3,709,042, Cl. 73-516.00r.

Lee, Stephen Arthur; Cardy, Charles Frederick; and Sampson, Keith George, to Laporte Industries Limited. Refractory compounds. 3,709,981, Cl. 423-346.000.

Lee, Sung Ki, to Hooker Chemical Corporation. Metalizing substrates. 3,709,714, Cl. 117-47.00a.
Leeds & Northrup Company: *See—*
Highley, Thomas T., Jr.; and Paschkis, Albert E., 3,710,342.
Leeming, Peter R.; Cross, Peter E.; Cox, David A.; and Augstein, Joachim, to Pfizer Inc. Alkylphenoxy-alkylamines as gastric anti secretory agents. 3,709,892, Cl. 260-293.830.
Leffingwell, John Charles, to Reynolds, R. J., Tobacco Company. Process for the preparation of dimetric imines and pyrroles. 3,709,890, Cl. 260-283.00r.
Legg, Leo V.: *See—*
Hoeg, Donald F.; Legg, Leo V.; and Tijunelis, Donatas, 3,710,007.
Hoeg, Donald F.; Legg, Leo V.; and Tijunelis, Donatas, 3,710,009.
Leibenzon, Semen Abramovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.
Leidich, Arthur John; and Malchow, Max Edward, to RCA Corporation. High frequency power transistor support. 3,710,202, Cl. 317-234.00r.
Leidig, Theodor: *See—*
Exner, Fritz; and Leidig, Theodor, 3,709,929.
Leimgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. O-Lower alkanoyl oximes of cyanoacetaldehyde. 3,709,922, Cl. 260-465.400.
Lemelson, Jerome H. Document scanning apparatus and method. 3,710,078, Cl. 235-61.11e.
Lemieux, William L. Bullet casting machine. 3,709,288, Cl. 164-325.000.
Lemoine, Marcel, to General Motors Corporation. Refrigerator door liners. 3,709,576, Cl. 312-138.00a.
Lemon, Peter Herbert Richard Bryan; and Terron, Christopher. Cold-set process for the production of phenolic novolak resinous foundry cores. 3,709,849, Cl. 260-29.300.
Lennon, Kenneth A.: *See—*
Cralle, Walter O., Jr.; and Lennon, Kenneth A., 3,710,079.
Leonard, Frank W. Roof trusses. 3,708,942, Cl. 52-94.000.
Leonard, Ward, Electric Co., Inc., mesne: *See—*
Ferraro, Ralph J., 3,710,133.
Leopold, Karl M.: *See—*
Karabinos, Joseph V.; Leopold, Karl M.; and Doherty, William P., 3,709,867.
Leopoldi, Norbert; and Rolin, Kenneth C., Sr. Umbrella. 3,709,238, Cl. 135-20.00r.
Lepley, Larry K. Azimuthal positioning system. 3,710,335, Cl. 343-112.00r.
L'Equipement General Electrique "Egelec": *See—*
Auchapt, Rene; and Gerard, Michel Jullien, 3,710,053.
Lerner, Julius O., 50% to Herman, David. Signal-responsive control system. 3,710,336, Cl. 343-225.000.
Les Fabriques d'Assortiments Reunies: *See—*
Davoine, Georges, 3,708,975.
Leska, Joseph P. Simultaneous multiple side punching apparatus. 3,709,082, Cl. 83-618.000.
Lever Brothers Company: *See—*
de Groot, Cornelis Nicolaas; Hobbs, John S.; and Tonsbeek, Christiaan Herman Theodoor, 3,709,697.
Fuhrmann, Gustav, 3,709,398.
Levey, John S., to Days-Ease Home Products Corporation. Insect trap. 3,708,908, Cl. 43-114.000.
Levin, Arie; and Arazi, Efraim. Textile pattern translator. 3,710,020, Cl. 178-5.20r.
Levin, Berton P.: *See—*
Anderson, Quinn S.; Levin, Berton P.; and Thomson, Jackie D., 3,709,192.
Levin, Boris Isaakovich: *See—*
Belkovsky, Viktor Alexandrovich; Grzhimalsky, Leopold Leopoldovich; Ilievsky, Irma Irmovich; Lotsmanov, Sergei Nikolaevich; Petrunin, Ivan Egorovich; Sukhov, Anatoly Vasilievich; Tikhonov, Boris Sergeevich; Levin, Boris Isaakovich; Moroz, Pavel Kirillovich Strekalov, Genrikh Nikolaevich; Chernov, Andrei Nikolaevich; Chizhov, Sergei Ilich; and Shevyakov, Nikolai Nikolaevich, 3,709,682.
Levine, Sheldon: *See—*
Simonson, Harris; Engelman, Ronald; and Levine, Sheldon, 3,709,121.
Lewis, Melvin A., to Loral Corporation. Microwave frequency memory device. 3,710,256, Cl. 325-6.000.
Li, Yao Tzu: *See—*
Lee, Shih-Ying; and Li, Yao Tzu, 3,709,042.
Liang, Charles C.; and Schlaikjer, Carl R., to Mallory, P. R., & Co., Inc. Cathodes for solid electrolyte cells. 3,709,734, Cl. 136-83.00r.
Libis, Bernard: *See—*
Habicht, Ernst; Libis, Bernard; and Zergenyi, Janos, 3,709,909.
Lichtenstein, Bernard, to Technicon Instruments Corporation. Method and apparatus for lymphocyte separation from blood. 3,709,791, Cl. 195-127.000.
Liebegott, Hans-Peter: *See—*
Schabel, Joachim; and Liebegott, Hans-Peter, 3,709,725.
Lifferth, Ewald: *See—*
Hell, Rudolf; Koll, Roman; and Lifferth, Ewald, 3,710,019.
Liggett, Robert W., to Cotton Producers Institute. Wet fixation of modifying agents on fibrous systems by heating in aqueous salt solution. 3,709,716, Cl. 117-63.000.
Light, Richard U., to Flat-Back Corporation. Portable vertebral column support. 3,709,557, Cl. 297-230.000.
Lilja, Lars Edvin; and Wallberg, Erik Arne, to Arenco Aktiebolag. Method for making tobacco webs and strings. 3,709,232, Cl. 131-140.00c.
Lilly, Eli, and Company: *See—*
Vandenberg, Willard J.; Chae, Hi Chul; Stewart, Elmer R.; Palmer, Wayne R.; and Padgitt, Howard R., 3,709,598.
Lincoln, Robert M.; and Meyers, Joseph A., III, to Atlantic Richfield Company. Method for bleaching groundwood pulp with tertiary butyl hydroperoxide. 3,709,778, Cl. 162-71.000.
Lindahl, Charles B., to North American Rockwell Corporation. Synthesis of oxychloride trifluoride. 3,709,982, Cl. 423-466.000.
Lindquist, Jesse L., to Oregon Metallurgical Corporation. Sheet reduction apparatus. 3,709,080, Cl. 83-355.000.
Lindsey, William C.: *See—*
National Aeronautics and Space Administration, 3,710,261.
Lindstol, Anders, to Ecodyne Corporation, mesne. Self-backwashing filter apparatus. 3,709,362, Cl. 210-108.000.
Lines, Raydon Ayers. Valve for fluid operated rotary engines. 3,709,102, Cl. 91-503.000.
Link, Edwin A. Under-ground vented non-metallic transformer assembly. 3,710,002, Cl. 174-18.000.
Linn, Wallace L.; and Voland, Elmo W., to Mallory, P. R., & Co., Inc. Periodic switch with deflectable kinetic energy storage cam operator and attached microswitch ramp. 3,710,043, Cl. 200-31.00r.
Lion Fat & Oil Co., Ltd.: *See—*
Susuki, Rinnosuke; Toyoda, Sadao; and Takenouchi, Kuniyoshi, 3,709,807.
Lipp, James, to International Business Machines Corporation. Method of making an electro-optic switch. 3,709,586, Cl. 350-320.000.
Liquid Nitrogen Processing Corporation: *See—*
Hall, Norma T., 3,709,773.
Liston, Paul. Board game apparatus comprising play programming means. 3,709,498, Cl. 273-131.0ab.
Litho-Paint Poster Company: *See—*
Berry, Thomas L., Jr., 3,708,899.
Litton Business Systems, Inc.: *See—*
Bartok, Stephen, 3,710,309.
Litton Industrial Systems, Inc.: *See—*
Montano, Joseph V., 3,709,054.
Litton Systems, Inc.: *See—*
Crapuchettes, Paul Wythe, 3,710,065.
Lloyd, Wayne B. Motion transmitting apparatus. 3,709,098, Cl. 91-46.000.
Lockhart, Robert William: *See—*
Hach, Vladimir; Lockhart, Robert William; and Cartlidge, Dennis Murray, 3,709,943.
Lockheed Aircraft Corporation: *See—*
Keenan, Peter P., 3,710,243.
Lahde, Reinhard N.; and Pawelek, Alex, 3,710,086.
Olson, David C., 3,709,522.
Loew, Frederic Christian; Stone, Edward; and Civardi, Frank Peter, to Inmont Corporation. Polyurethanes. 3,709,864, Cl. 260-32.60n.
Lofquist, Robert Alden; Crescentini, Lamberto; and Winckhofer, Charles, to Allied Chemical Corporation. Method of preparing cationic dyeable polycaprolactam. 3,709,865, Cl. 260-18.00n.
Logimetrics, Incorporated: *See—*
Basse, Philip; and Sposato, Frank J., 3,710,274.
Lohrke, James L., to Turbo Machine Company. Method for leveling tow. 3,708,832, Cl. 19-6.0st.
Lombard, Claude; and Piret, Jean, to Regie Nationale des Usines Renault and Automobiles Peugeot. Governor unit for automatic transmission. 3,709,070, Cl. 74-866.000.
Looker, Olin L.; Zemke, Frederick A.; Knicely, David R.; Rouse, Russell V.; and Slates, Larry L., to FMC Corporation. Multi-beater thresher. 3,709,231, Cl. 130-30.00h.
Loos, Herbert, to Hurth, Carl, Maschinen- und Zahnradfabrik. Tool for the chipless working and deburring of gears. 3,709,015, Cl. 72-71.000.
Loral Corporation: *See—*
Lewis, Melvin A., 3,710,256.
Lorenz, Eldon L., to Michigan Wheel Corporation. Folding blade propeller. 3,709,634, Cl. 416-142.000.
Lorraine Industries, Inc.: *See—*
Sherwood, Henry A., 3,709,504.
Loshbough, Richard C.: *See—*
Williams, Roger B., Jr.; Loshbough, Richard C.; and Deitemeyer, Stanley A., 3,709,309.
Lotsmanov, Sergei Nikolaevich: *See—*
Belkovsky, Viktor Alexandrovich; Grzhimalsky, Leopold Leopoldovich; Ilievsky, Irma Irmovich; Lotsmanov, Sergei Nikolaevich; Petrunin, Ivan Egorovich; Sukhov, Anatoly Vasilievich; Tikhonov, Boris Sergeevich; Levin, Boris Isaakovich; Moroz, Pavel Kirillovich Strekalov, Genrikh Nikolaevich; Chernov, Andrei Nikolaevich; Chizhov, Sergei Ilich; and Shevyakov, Nikolai Nikolaevich, 3,709,682.
Louche, Jean Claude Paul: *See—*

Loucheur, Rene; Hommerin, Michel; and Louche, Jean Claude Paul, 3,710,106.

Loucheur, Rene; Hommerin, Michel; and Louche, Jean Claude Paul, to Compagnie Generale de Radiologie. X-ray film handling apparatus. 3,710,106, Cl. 250-66.000.

Lubersky, Albert R., to Fibreboard Corporation. Apparatus and method for applying collars to container blanks. 3,709,110, Cl. 93-36.600.

Lucas, Joseph, (Industries), Limited: *See—*
Bright, Peter Frederick; and Germany, Michael John, 3,710,097.
Downing, Eric William, 3,709,205.
Goodman, Dennis George, 3,708,870.
Hill, William Frank, 3,710,227.
Martin, Rex, 3,708,850.

Luck, Raymond T., to Kraftco Corporation. Display container. 3,709,371, Cl. 211-49.00d.

Luderer, Fred: *See—*
Gebhardt, Otto; Luderer, Fred; and Stahlschmidt, Karl-Heinz, 3,709,434.

Ludwig, Gustav. Protective shelter installation. 3,709,168, Cl. 109-1.00s.

Lugovskoi, Andrei Lukyanovich: *See—*
Abramov, Viktor Petrovich; Junga, Yan Petrovich; Berzin, Gunard Valdemarovich; Skrupsky, Voldemar Petrovich; Frolov, Petr Nikolaevich; Lugovskoi, Andrei Lukyanovich; Shilgorin, Felix Alexandrovich; Dalbinsh, Yan Yanovich; Rotsen, Karl Arturovich; Ziemelis,Andris Eduardovich; Elksnis, Artur Yanovich; and Priede, Bruno Andreevich, 3,709,270.

Lukens, Samuel C., Jr., to Electronic Data Controls Corporation, mesne. Electronic amusement device. 3,709,499, Cl. 273-138.00a.

Lukhovitsky, Vladimir Isaakovich; Smirnov, Andrei Mikhailovich; Polikarpov, Vladimir Vasilievich; Lebedeva, Alla Mikhailovna; Lagucheva, Raisa Mizovna; and Karpov, Vladimir Lvovich. Method of polymerization of vinyl chloride and producing its copolymers. 3709,804, Cl. 204-159.220.

Lumenition Limited: *See—*
Ford, Eric Harold, 3,710,131.

Lurex, Inc.: *See—*
Bercz, Christa V.; Rozmanith, Jolan S.; and Bercz, Jeno P., 3,708,903.

Lutz, Karl; and Schuler, Max, to Sandoz Ltd.; a/k/a Sandoz AG. O-lower alkyl-O-[2 alkokycarbonyl-methyl] vinyl-monoalkylamido phosphates. 3,709,960, Cl. 260-941.000.

Lynch Communication Systems, Inc.: *See—*
Nordling, Frederick, 3,710,022.

Lyoflo-Stopper Corporation: *See—*
Ogle, Robert W., 3,708,886.

Lyon, Walter R.: *See—*
Farrell, George J.; Lyon, Walter R.; Mills, Loring K.; and Shaw, Reginald O., 3,709,132.

Maag Gear Wheel & Machine Company, Limited: *See—*
Sigg, Hans, 3,709,343.

Macalalad, Fidel Villaluna; and Katerndahl, Dean R., to Abbott Laboratories. Contamination-preventing sheath and retaining sleeve for intravenous catheter. 3,709,223, Cl. 128-214.400.

Macaulay, Malcolm J.: *See—*
Kimball, Pleasent P.; Hagey, Robert H.; and Macaulay, Malcolm J., 3,710,313.

MacCorkell, Albert W.: *See—*
Breidert, George M.; and MacCorkell, Albert W., 3,709,016.

Mace, Irving. Combination cleat and bumper. 3,709,183, Cl. 114-220.000.

MacFarlane, Iain Mackay, to Fiber Industries, Inc. Yarn process. 3,708,970, Cl. 57-140.00r.

MacGregor International S.A.: *See—*
Ansund, Bo Kent, 3,708,914.

Machida, Yasuhiko: *See—*
Tanaka, Kazunobu; Machida, Yasuhiko; Suzuki, Norio; and Kohashi, Tadao, 3,710,181.

Mack, Earl J.: *See—*
Smedley, Richard W.; and Mack, Earl J., 3,709,163.

Mackin, Michael H.: *See—*
Clearman, Jack F.; Ohlsson, Leonard W.; and Mackin, Michael H., 3,708,992.

MacMillan Bloedel Limited: *See—*
Hach, Vladimir; Lockhart, Robert William; and Cartlidge, Dennis Murray, 3,709,943.
Mathur, Vishwa N.P., 3,710,064.

MacMillan, Kenneth T., to MacMillan Mold Company, Inc. Method of manufacturing a conduction heater. 3,709,280, Cl. 164-112.000.

MacMillan Mold Company, Inc.: *See—*
MacMillan, Kenneth T., 3,709,280.

MacNeill, James Taylor: *See—*
Morrison, Robert; and MacNeill, James Taylor, 3,709,375.

Macrae, Herbert N.: *See—*
Klapes, Michael C.; and Macrae, Herbert N., 3,709,385.

Maeder, Arthur: *See—*
Toepfl, Rosemarie; Abel, Heinz; and Maeder, Arthur, 3,709,847.

Magarillo, Boris Lvovich: *See—*
Dukhovny, Rafael Gershonovich; Magarillo, Boris Lvovich; Naidenov, Alexandr Ivanovich; Ovcharov, Bladimir Vasilievich; and Potapjik, Nikolai Nikolaevich, 3,709,103.

Maggioni, Paola: *See—*
Bernardi, Luigi; Bertazzoli,Cesare; Chieli, Tecla; and Maggioni, Paola, 3,709,893.

Magoon, Eugene F., to Shell Oil Company. Production of methanol. 3,709,919, Cl. 260-449.500.

Mah, George: *See—*
Wright, Robert J.; Chapin, John S.; Mah, George; and Karstendiek, Claude A., 3,709,809.

Mahaffy & Harder Engineering Company: *See—*
Mahaffy, Reid A.; Hamilton, Joel A.; and Pinney, Wesley W., 3,709,702.

Mahaffy, Reid A.; Hamilton, Joel A.; and Pinney, Wesley W., to Mahaffy & Harder Engineering Company. Hermetically sealed food package. 3,709,702, Cl. 99-174.000.

Mailloux, Robert J.; and Caron, Paul R., to United States of America, National Aeronautics and Space Administration. Phase control circuits using frequency multiplication for phased array antennas. 3,710,329, Cl. 343-100.0sa.

Mains, Robert T., to Parker-Hannifin Corporation. Weld joint. 3,709,529, Cl. 285-286.000.

Makino, Yoshio: *See—*
Oda, Nakaaki; Morioka, Nagaharu; Makino, Yoshio; and Yoshida, Akira, 3,709,824.

Makosch, Gunter, to International Business Machines Corporation. Optical system for focusing spaced object planes in a common image plane. 3,709,579, Cl. 350-30.000.

Malchow, Max Edward: *See—*
Leidich, Arthur John; and Malchow, Max Edward, 3,710,202.

Malkiewicz, Wladyslaw F., to Tenneco Inc. Muffler with longitudinal chamber. 3,709,321, Cl. 181-50.000.

Mallinckrodt Chemical Works: *See—*
Holgate, Richard L.; and Montgomery, James R., 3,710,118.
Pitt, Larry L.; and Starbuck, James W., 3,709,826.

Mallory, P. R., & Co., Inc.: *See—*
Liang, Charles C.; and Schlaikjer, Carl R., 3,709,734.
Linn, Wallace L.; and Voland, Elmo W., 3,710,043.

Malmberg, Paul R.: *See—*
O'Keeffe, Terence W.; and Malmberg, Paul R., 3,710,101.

Maloney, Martin V.: *See—*
Chase, David O.; Maloney, Martin V.; Wood, Frederick J., Jr.; and Wood, Barry B., 3,708,821.

Maltby, Frank V., to Bata Shoe Company, Inc. Manufacture of footwear and/or components thereof by injection molding of synthetic resinous material or other molding materials. 3,709,973, Cl. 264-244.000.

Manabe, Mitsuo: *See—*
Kobayashi, Kengo; and Manabe, Mitsuo, 3,710,363.

Mandelberg, Simon Lvovich: *See—*
Raichuk, Jury Isaakovich; Knyazhinsky, Zakhar Osipovich; Mandelberg, Simon Lvovich; Lebedev, Vladimir Konstantinovich; and Volkov, Viktor Nikolaevich, 3,710,066.

Mann, James F. Self contained adjustable support assemblies to support, raise, and lower a mobile living facility with respect to both a vehicle and the ground. 3,709,467, Cl. 254-45.000.

Mann, Richard Charles, Sr.; and Schwalm, Glendon Henry, to AMP In, corporated. Wire connection, method, and connecting apparatus. 3,708,878, Cl. 29-628.000.

Mano, Hiroshi: *See—*
Sawada, Hideo; Rin, Ensei; Yamada, Isao; Mano, Hiroshi; and McGourty, Thomas K., 3,710,359.

Manor, Warren H. Mobile collapsible scaffold. 3,709,251, Cl. 137-343.000.

Marach, David R.: *See—*
Shea, Gerald J.; and Marach, David R., 3,710,090.

Marancik, william G.: *See—*
Shattes, Walter J.; and Marancik, william G., 3,710,000.

Marathon Broadcast Equipment Sales Corporation: *See—*
McFadden, William G., 3,710,039.

Marco, Alex A.; and Wirth, Dennis L., said Marco and said Wirth a part interest to each. Propulsion and control system for motorboat. 3,709,187, Cl. 115-35.000.

Marco and said Wirth a part interest to each: *See—*
Marco, Alex A.; and Wirth, Dennis L., 3,709,187.

Marconi Company Limited, The: *See—*
Ryley, Derek Vernon; and Claydon, Gyongyver, 3,710,018.

Marconi Instruments Limited: *See—*
O'Neill, Damer Evelyn, 3,710,253.

Marcus, Konrad H.: *See—*
Cain, Wayne R.; Marcus, Konrad H.; and Prince, Edgar D., 3,708,828.

Marek, James R.; and Kershaw, Stanley S., Jr., to McGraw-Edison Company. Disconnector for surge arresters. 3,710,212, Cl. 317-66.000.

Marek, Josef; and Hayn, Gunther, to Austria Tabak Werke Aktiengesellschaft. Method and apparatus for regulating output in tobacco cutting machines. 3,709,274, Cl. 83-13.000.

Marine and Industrial Developments Limited: *See—*
Papanicolaou, John Paul; and Galati, Telemachus Nicolas, 3,709,181.

Marion, Charles P.; Schlinger, Warren G.; and Slater, William L., to Texaco Inc. Methane production. 3,709,669, Cl. 48-215.000.

Marker, Hannes. Device for adjusting the retaining force which is to be overcome for a safety release of a toe or heel holder of a safety ski binding. 3,709,511, Cl. 280-11.35t.

Marks, Alvin M. Method for forming submicron dipole particles. 3,709,828, Cl. 252-300.000.

Marotha Scientific Controls, Inc.: *See—*
Spangenberg, Gerhard, 3,709,253.

Martin, Rex, to Lucas, Joseph, (Industries) Limited. Means for securing a body to a panel. 3,708,850, Cl. 29-203.00p.

Martin, William F.; and Ranta, Esko E. Bag holding apparatus. 3,709,449, Cl. 248-101.000.

Martin-Marietta Corporation: *See—*
Laux, Leon E., 3,709,094.

Martincic, Paul W.; and Miller, James R., to Westinghouse Electric Corporation. Methods of constructing electrical inductive apparatus. 3,708,875, Cl. 29-605.000.

Martinez, Felix Jesus, to Baxter Laboratories, Inc. Support structure for membrane diffusion device. 3,709,367, Cl. 210-321.000.

Marx, Matthias: *See—*
Eckert, Guenter; Hartmann, Heinrich; Marx, Matthias; and Wuertele, Lothar, 3,709,724.

Maschinenfabrik Sack GmbH: *See—*
Petsch, Ernst, 3,709,013.

Mason, John R., to Dracon Industries. Termination tool. 3,708,852, Cl. 28-203.00h.

Massa Division, Dynamics Corporation of America: *See—*
Massa, Frank; and Hubbard, John F., 3,710,151.

Massa, Frank; and Hubbard, John F., to Massa Division, Dynamics Corporation of America. Electroacoustic transducers for use at high temperatures and pressures. 3,710,151, Cl. 310-8.900.

Massachusetts Institute of Technology: *See—*
Bush, Vannevar; and Smith, Joseph L., Jr., 3,708,979.

Massat, Heinz: *See—*
Klementz, Peter; Massat, Heinz; Nitschke, Christoph; and Haubold, Herbert, 3,708,969.

Mathes, Alva F.: *See—*
Bolster, Gene A.; and Mathes, Alva F., 3,708,860.

Mathur, Vishwa N.P., to MacMillan Bloedel Limited. Microwave drying system. 3,710,064, Cl. 219-10.550.

Matshshita Electric Industrial Co., Ltd.: *See—*
Yamamoto, Keisuke; and Fujimori, Toshimitsu, 3,710,273.

Matsui, Masanao; Kato, Takeaki; Ueda, Kenzo; Mizutani, Toshio; Kitamura, Shigeyoshi; Fujimoto, Keimei; and Okuno, Yositosi, to Sumitomo Chemical Company, Ltd. Cyclopropanecarboxylic acid esters. 3,709,910, Cl. 260-326.00r.

Matsumoto, Yushi; Ozawa, Tunahiro; Ochiai, Tadashi; and Sakai, Masaomi, to Tokyo Shibaura Electric Co., Ltd. Electrostatic copying apparatus for polychromatic picture. 3,709,593, Cl. 355-4.000.

Matsuo, Yoshihiro; Sasaki, Hiromu; and Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. Ceramic dielectric material comprising barium-sodium-niodium titanate. 3,709,704, Cl. 106-39.00r.

Matsushita Communication Industrial Co., Ltd.: *See—*
Watanabe, Seizi; Ozaki, Kozo; Oishi, Hiroshi; Aoki, Fumio; and Kawano, Shigeru, 3,710,373.

Matsushita Electric Industrial Co., Ltd.: *See—*
Fukuda, Masataro; Miura, Takashi; and Takahashi, Katsuhiro, 3,709,834.
Kamio, Kenzo; and Miyoshi, Seizo, 3,709,503.
Kohashi, Tadao; Nakamura, Tadao; and Nakamura, Shigeaki, 3,710,127.
Matsuo, Yoshihiro; Sasaki, Hiromu; and Hayakawa, Shigeru, 3,709,704.

Matsushita Electric Industrial Company, Limited: *See—*
Tanaka, Kazunobu; Machida, Yasuhiko; Suzuki, Norio; and Kohashi, Tadao, 3,710,181.

Matsushita, Takeshi, to Sony Corporation. Negative impedance semiconductor device with multiple stable regions. 3,710,206, Cl. 317-235.00r.

Mattei, Silvano: *See—*
Ullmann, Werner; Derighetti, Renato; Tadini, Constantino; Farinelli, Roberto; and Mattei, Silvano, 3,710,067.

Matthews, Bernard John, to Lee, Raymond, Organization, Inc., The. Biorythmic indicator. 3,709,430, Cl. 235-109.000.

Matthews, Frank E., to Environmental General Corporation, mesne. Bed patient isolation system. 3,709,210, Cl. 128-1.00r.

Mattson, Herbert L. Mold for casting a weighted treble fishing hook. 3,709,458, Cl. 249-95.000.

Matzl, Manfred. Logic-controlled thyristor system for performing tap-changing operations. 3,710,232, Cl. 323-43.50s.

Maughan, Robert F.: *See—*
Smart, David Ol, IV; Pennington, Grover B.; Plettner, Richard M.; and Maughan, Robert F., 3,709,363.

Mausner, Marvin L.; and Dater, Arnold H., to Witco Chemical Corporation. Liquid detergent compositions. 3,709,838, Cl. 252-545.000.

Mautner, Steven E., to Craig Systems Corporation. Composite panel structure having mounting inserts therein. 3,709,733, Cl. 161-37.000.

Maxwell, Donald Robert: *See—*
Amin, Shirish Chandubhai; Jones, David Henry; and Maxwell, Donald Robert, 3,709,879.

May & Baker Limited: *See—*
Amin, Shirish Chandubhai; Jones, David Henry; and Maxwell, Donald Robert, 3,709,879.

May, Harold Frederick: *See—*
Laggy, William Joseph; and May, Harold Frederick, 3,710,025.

Mayes, Paul E., to JFD Electronics Corporation. Small, broadband, unidirectional antenna. 3,710,340, Cl. 343-725.000.

Maytag Company, The: *See—*
Cotton, Curran D., 3,710,138.
McCartney, Edward O., 3,709,368.

Mazza, Jorge Aurelio. Reactive triazine azo dyestuffs. 3,709,869, Cl. 260-153.000.

Mc Farland, Harold L., Jr.: *See—*
Cohen, John B.; Janson, Paul E.; Mc Farland, Harold L., Jr.; and Young, James B., Jr., 3,710,324.

Mc Pherson, Gary C., to Honeywell Inc. Unitized plated wire memory plane. 3,710,355, Cl. 340-174.0pw.

McAinsh, Kenneth Gordon: *See—*
Lamb, Edward Lawrence; McAinsh, Kenneth Gordon; and Smith, Ralph David, 3,709,589.

McCarthy, James F., to Free Winds, Inc. Travel trailer construction. 3,709,551, Cl. 296-23.00r.

McCarthy, John H.: *See—*
Baker, Ralph W.; McCarthy, John H.; Place, Harold G.; and Wikman, Andrew O., 3,709,950.

McCarthy, Lauris J. Support for an electric cell. 3,710,306, Cl. 339-108.000.

McCartney, Edward O., to Maytag Company, The. Centrifugal extractor mounting. 3,709,368, Cl. 210-365.000.

McConnell, Frederick C.; Jason, George; and Armstrong, Neil J. Aerial survey. 3,709,607, Cl. 356-152.000.

McCurdy, Robert F.: *See—*
Karp, Joseph G., Jr.; and McCurdy, Robert F., 3,708,916.

McDowell, Curtis S.; and Barnes, Michael W., to United States of America, Air Force. Methylene-O,O'-bis (ethylacethydroximate). 3,709,920, Cl. 260-453.00r.

McEvilly, Richard J.: *See—*
Haarhaus, John J.; and McEvilly, Richard J., 3,710,108.

McEwen, Cassius R.: *See—*
Carleton, Joseph G.; McEwen, Cassius R.; and Williams, Frederick G., Jr., 3,708,948.

McFadden, William G., to Marathon Broadcast Equipment Sales Corporation. Methods and apparatus for adjusting tape within a cartridge to minimize differential phase shift in multiple channel tape recording and reproduction. 3,710,039, Cl. 179-100.20z.

McFarland, L. D., Company: *See—*
Flory, Lester W., 3,709,271.

McFarlin, Ralph M., to Esquire, Inc. Adjustable support for light fixtures. 3,710,096, Cl. 240-63.000.

McGehee, Archie L., to Allis-Chalmers Manufacturing Company. Lift truck mast. 3,709,393, Cl. 214-674.000.

McGlasson, Frank W., to Singer Company, The, mesne. Wide angle infinity image visual display. 3,709,581, Cl. 350-174.000.

McGough, Gregory J., 1/8 to Fox, Richard H., 1/8 to Grui, Charles, 1/8 to McGough, Peter J., 1/8 to Nonnemacher, Vincent, 1/8 to Schwartz, Gary R., 1/8 to Valencour, Frederick H. and 1/8 to Vieman, John M. Snowmobile with hydraulic device. 3,709,312, Cl. 10-5.00r.

McGough, Peter J.: *See—*
McGough, Gregory J., 3,709,312.

McGourty, Thomas K.: *See—*
Sawada, Hideo; Rin, Ensei; Yamada, Isao; Mano, Hiroshi; and McGourty, Thomas K., 3,710,359.

McGraw-Edison Company: *See—*
Marek, James R.; and Kershaw, Stanley S., Jr., 3,710,212.
Urani, Angelo, 3,710,296.

McGregor, Eugene R., to Universal Oil Products Company. Self-cleaning ashtray with collecting hopper. 3,709,427, Cl. 232-43.100.

McIntosh, Harold A., to Robertshaw Controls Company. Valve control system. 3,709,460, Cl. 251-11.000.

McJones, Robert W. Fill limiter, check and safety valve. 3,709,241, Cl. 137-71.000.

McKay, Robert S.: *See—*
Terzian, Reuben; McKay, Robert S.; and Glass, Marvin I., 3,708,913.

McKee, James B.; and Canaday, Joh L., to Aid For Business, Incorporated. Document identification and protection stem. 3,709,524, Cl. 282-22.00r.

McKendry Lennon H.: *See—*
Edamura, Fred Y.; McKendry Lennon H.; and Larsen, Eric R., 3,709,926.

McKenzie, Donald J.; and Friedly, Ernest F. Centrifuges. 3,709,429, Cl. 233-26.000.

McLaughlin, Thomas M., to American Formed Plastics Corporation. Refrigerator structure. 3,708,997, Cl. 62-449.000.

McMaster, Robert C., to Ohio State University, The. Power conversion means. 3,710,150, Cl. 310-8.100.

McMillan, Allen, to Bomac Manufacturing Corporation. Tobacco stripping stand assembly. 3,709,391, Cl. 214-300.000.

McNeill, Frank M., to Tee-Pak, Inc. Method of winding tubular films or webs and resulting product. 3,709,703, Cl. 99-176.000.

McNulty, Patrick J.; Swithenbank, Colin; Viste, Kenneth L.; and von Meyer, William C., to Rohm & Haas Company. 2-Aryl-4,4-di alkyl-5-halomethylene-oxazolines. 3,709,897, Cl. 260-307.00f.

McQuinn, Max R.: *See—*
Edwards, James D.; and McQuinn, Max R., 3,710,042.

Mead Corporation, The: *See—*
Robertson, John A., 3,709,432.

Means, F. W., Company: *See—*
Wetzler, Justin J., 3,709,659.

Medler, Albert, to Plastigage Corporation. Method of forming a construction member of glass fiber elements. 3,709,754, Cl. 156-161.000.

Medovar, Boris Izrailevich: *See—*

Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.

Medovar, Boris Izrailevich; Popov, Viktor Andreevich; Alferov, Jury Fedorovich; Bogachenko, Alexey Georgievich; and Latash, Jury Vadimovich. Convertible electrode electric furnace installation and method. 3,709,997, Cl. 13-14.000.

Meindersma, Tabe Ernst: *See—*
Boonstra, Willem Frederik; Meindersma, Tabe Ernst; and Van Galen, Piet, 3,708,963.

Menz, Horst: *See—*
Kuipers, Egbert; Gunnewig, Paul; and Menz, Horst, 3,710,290.

Merck & Co., Inc.: *See—*
Goegelman, Robert T.; and Miller, Thomas W., 3,709,880.
Ziegler, Carl; and Sprague, James M., 3,709,917.

Merikallio, Pauli Assar Antero. Protective blanket. 3,708,810, Cl. 5-343.000.

Merlin Gerin, Societe Anonyme: *See—*
Payen, Jean-Pol, 3,709,337.

Mertl, Klaus: *See—*
Volker, Ulrich; Fabian, Hein; and Mertl, Klaus, 3,710,071.

Meserole, Robert H., to Johns-Manville Corporation. Method of connecting duct or conduit sections. 3,708,867, Cl. 29-525.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Barbacsy, Ludwig Benno; Muck, Gunther; and Plantikow, Ulrich, 3,710,153.

Metalmeccanica S.p.A.: *See—*
Comerio, Ercole, 3,709,172.

Metron Corporation: *See—*
Gerauer, Ernst A., 3,709,049.

Mettler Instrumente AG: *See—*
Appius, Max K., 3,709,311.

Meyer, Alton H.; and Monday, William C., to Recognition Equipment Incorporated. Document feeder. 3,709,481, Cl. 271-30.00a.

Meyer, Howard M.; and Reichardt, Mayo M., to General Motors Corporation. Automated roller clutch assembly. 3,708,849, Cl. 29-201.000.

Meyers, Charles O.: *See—*
Christopher, William H., Jr.; Meyers, Charles O.; and Whipple, Jack C., Jr., 3,708,960.

Meyers, Joseph A., III: *See—*
Lincoln, Robert M.; and Meyers, Joseph A., III, 3,709,778.

Meyers Printing Company: *See—*
O'Neil, John E., 3,709,763.

Michael, Paul S.: *See—*
Kronfeld, Alan C.; and Michael, Paul S., 3,710,362.

Michalik, Edmund R.: *See—*
Dahlberg, John R.; Oravitz, James L., Jr.; and Michalik, Edmund R., 3,709,414.

Michel, Donald P.; Steinige, Herman; Landis, Franklin F.; and Skeen, Lawrence, to Bauer Bros. Co., The. Refiner installation. 3,709,443, Cl. 241-285.000.

Michellone, Giancarlo; Palazzetti, Mario; and Tabasso, Giovanni, to Fiat Societa per Azioni. Method and apparatus for the anti-skid braking of vehicles. 3,709,566, Cl. 303-21.0be.

Michigan Wheel Corporation: *See—*
Lorenz, Eldon L., 3,709,634.

Micro-Bit Corporation: *See—*
Smith, Donald O.; Harte, Kenneth J.; Cohen, Mitchell S.; Newberry, Sterling P.; and Speliotis, Dennis E., 3,710,352.

Micro-Magnetic Industries, Inc.: *See—*
Roundy, Carlos B.; Riddle, John B.; and Heintz, Ralph M., 3,710,218.

Mihara, Koji: *See—*
Fujio, Yoshio; Kitamura, Yoshihiro; Mihara, Koji; and Hamada, Tsuneakira, 3,710,016.

Mikac, Mojimar: *See—*
Jurasek, Jaromir; Mikac, Mojimar; and Podzimek, Karel, 3,708,815.

Milanese, Vincenzo; and Bianchi, Angelo, to Ferrania S.p.A. Camera shutter. 3,709,127, Cl. 95-31.0fl.

Milchem Incorporated: *See—*
Browning, William C.; Chesser, Billy G.; and Wood, Jerry L., 3,709,819.

Miles, John L., to Baird-Atomic, Inc., mesne. Product and process involving optical thin film filters protected against deterioration from humidity. 3,709,765, Cl. 161-1.000.

Miles Laboratories, Inc.: *See—*
Clemens, Anton Hubert, 3,709,612.

Miller, Cary: *See—*
Galowin, Lawrence S.; De Santis, Michael J.; and Miller, Cary, 3,709,041.

Miller, George T., to Hooker Chemical Corporation. Metalizing substrates. 3,709,727, Cl. 117-213.000.

Miller, Herman, Inc.: *See—*
Ostertag, Hubert L., 3,709,555.

Miller, James R.: *See—*
Martincic, Paul W.; and Miller, James R., 3,708,875.

Miller, O. Neal, to Hoffmann-La Roche, Inc. Hypolipidemic method. 3,709,991, Cl. 424-266.000.

Miller, Richard G., to Ontario Cancer Institute. Device for separating living cells. 3,709,361, Cl. 210-83.000.

Miller, Robert C., to Honeywell Inc. Pneumatic pulse counter. 3,710,123, Cl. 235-201.000.

Miller, Robert Pincus; Badian, Abraham; and Dickstein, Samuel P., to Scanamation Corporation. Optical character recognition system. 3,710,319, Cl. 340-146.30j.

Miller, Thomas W.: *See—*
Goegelman, Robert T.; and Miller, Thomas W., 3,709,880.

Mills, Loring K.: *See—*
Farrell, George J.; Lyon, Walter R.; Mills, Loring K.; and Shaw, Reginald O., 3,709,132.

Mills, William D. Strip measuring apparatus. 3,709,078, Cl. 83-226.000.

Milo, August, to Universal Valve Company, Inc. Frost heave-protected shut-off valve with lockable nipple. 3,709,240, Cl. 137-6.00b.

Milwaukee Boiler Mnaufacturing Co.: *See—*
Mueller, Norman W., 3,709,046.

Mima, Masahiko, to Otsuka Pharmaceutical Company, Limited. Method of producing an epidural nerve block. 3,709,986, Cl. 424-128.000.

Minami, Muneyoshi, to Toray Industries, Inc. Process for the preparation of polyimides. 3,709,862, Cl. 260-47.0cp.

Minami, Satoyuki; Shinke, Yoshiaki; Saito, Ahozi; and Osakada, Atsushi, to Toray Industries, Inc. Process for the preparation of radiation-crosslinkable foamable polyolefin particles. 3,709,806, Cl. 204-159.200.

Minchin, Kenneth R. Tether ball holder. 3,709,491, Cl. 273-58.00c.

Ministry of International Trade and Industry: *See—*
Hayashi, Tutaka; and Tarui, Yasuo, 3,710,041.

Minnesota Mining and Manufacturing Company: *See—*
Fridinger, Tomas L.; Mutsch, Edward L.; and Pauly, David R., 3,709,936.
Kreitz, Richard W.; and Svendsen, John A., 3,709,472.
Sowman, Harold G., 3,709,706.
Will, Eugen, 3,709,191.

Minshell, Herman G., to Kimberly-Clark Corporation. High pile product. 3,709,750, Cl. 156-72.000.

Minsk, Louis M.: *See—*
Cohen, Hyman L.; King, James R., Jr.; and Minsk, Louis M., 3,709,690.

Mintz, Ezra, to Technical Wire Products, Inc., mesne. Shielding and sealing gasket material and methods of fabricating it. 3,708,871, Cl. 29-592.000.

Mitchell, John H. Automatic one line grapple. 3,709,550, Cl. 294-111.000.

Mitchell, Maurice E. Overhead service apparatus with swivel platform. 3,709,322, Cl. 182-625.000.

Mitchell, William E., to Dunlop Holdings Limited. Method of mounting pneumatic tire on vehicle wheels. 3,708,847, Cl. 29-159.010.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Fujio, Yoshio; Kitamura, Yoshihiro; Mihara, Koji; and Hamada, Tsuneakira, 3,710,016.

Mitsubishi Electric Corporation: *See—*
Ito, Toshio; Nomaguchi, Tamotsu; and Tabata, Norikazu, 3,709,473.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Hirai, Masuhiko; Takatsu, Toshiharu; Hashimoto, Kazuyoshi; and Hozoji, Akira, 3,709,007.

Mitsueda, Hisami: *See—*
Kawashima, Yoshichi; and Mitsueda, Hisami, 3,710,183.

Mitsugi, Takashi: *See—*
Kondo, Eiji; Mitsugi, Takashi; and Tori, Kazuo, 3,709,789.

Mitsui Toatsu Chemicals Incorporated: *See—*
Goya, Yoshihito; Nakanishi, Michio; Sawatari, Kenichi; Hirose, Akira; and Shinozawa, Tetsuichi, 3,709,674.

Miura, Misao, to Seibu Gomu Kagaku Kabushiki Kaisha. Fender assembly. 3,708,988, Cl. 61-48.000.

Miura, Takashi: *See—*
Fukuda, Masataro; Miura, Takashi; and Takahashi, Katsuhiro, 3,709,834.

Miwa, Osamu; and Kayano, Yosiro, to Fujitsu Limited. Data transferring circuit arrangement for transferring date between memories of a computer system. 3,710,349, Cl. 340-172.500.

Miyake, Hirotaka; and Kawai, Shinji, to Aisin Seiki Kabushiki Kaisha. Hydraulic brake pressure control system and method for vehicles. 3,709,568, Cl. 303-22.00r.

Miyake, Minoru. Method of making an arch. 3,708,944, Cl. 52-745.000.

Miyamoto, Naokichi. Ball-point pen convertible for use as a pointer. 3,709,620, Cl. 401-195.000.

Miyoshi, Seizo: *See—*
Kamio, Kenzo; and Miyoshi, Seizo, 3,709,503.

Mizusawa Industrial Chemicals, Ltd.: *See—*
Sugahara, Yujiro; and Tanaka, Masanori, 3,709,823.

Mizutani, Toshio: *See—*
Matsui, Masanao; Kato, Takeaki; Ueda, Kenzo; Mizutani, Toshio; Kitamura, Shigeyoshi; Fujimoto, Keimei; and Okuno, Yositosi, 3,709,910.

Mlodzinski, John J., to Smith Kline & French Laboratories. Tablet classification machine. 3,709,329, Cl. 209-75.000.

Mobil Oil Corporation: *See—*

Caldwell, Richard L.; and Givens, Wyatt W., 3,710,112.
Chu, Pochen, 3,709,979.

Moder, Hans-Ulrich: *See—*
Grossman, Gunter; Moder, Hans-Ulrich; and Schubert, Rolf, 3,710,029.

Moffat, James: *See—*
Williamson, David T. N.; Moffat, James; and Wood, William, 3,709,384.

Moffatt, John G.; and Russell, Alan F., to Syntex Corporation. 1-β-D-arabinofuranosyl cytosine derivatives and methods of preparing. 3,709,874, Cl. 260-211.50r.

Mohr, Johannes; and Cast, Adolf, to Reich, Karl M., Maschinenfabrik. Fastener sorting apparatus. 3,709,328, Cl. 209-73.000.

Mohri, Yohichi. Power transmission. 3,709,068, Cl. 74-866.000.

Moisar, Erik: *See—*
Florens, Raymond Leopold; Claes, Frans Henri; and Moisar, Erik, 3,709,689.

Molins Limited: *See—*
Doerman, Eryk Stefan, 3,709,028.

Molins Machine Company, Limited: *See—*
Williamson, David T. N.; Moffat, James; and Wood, William, 3,709,384.

Molyneaux, John William. Rotary internal combustion engine. 3,709,199, Cl. 123-8.470.

Monarch Machine Tool Company, The: *See—*
Sturm, Walter V.; and Doll, Claude S., 3,709,377.

Monarch Marking Systems, Inc.: *See—*
Grushon, Harold N., 3,709,420.

Monday, William C.: *See—*
Meyer, Alton H.; and Monday, William C., 3,709,481.

Monogram Industries, Inc.: *See—*
Kemper, James M., 3,708,806.

Monsanto Chemicals Limited: *See—*
Tripp, Terence Gordon, 3,709,801.

Monsanto Company: *See—*
Behforouz, Mohammad, 3,709,907.
Boustany, Kamel; and Coran, Aubert Yaucher, 3,709,845.
Cronkhite, Paul W.; Voege, Robert D.; and Poletti, Joseph W., 3,708,921.
Singleton, Thomas C., 3,709,795.
Wilder, Gene R., 3,709,905.

Montagne, Jean Bernard, to Compagnie Generale des Etablissements Michelin, raison Sociale Michelin & Cie. Bead area carcass cord arrangement for radial tires. 3,709,276, Cl. 152-362.000.

Montagne, Jean Bernard, to Compagnie Generale des Etablissements Michelin, raison Sociale Michelin & Cie. Elastomers associated with cords of radial tire at points close to and removed from beads. 3,709,277, Cl. 152-374.000.

Montano, Joseph V., to Litton Industrial Systems, Inc. Chain connecting link. 3,709,054, Cl. 74-258.000.

Monte, Ernest; and Quadri, Syed H., to Sunbeam Lighting Co. Fluorescent luminaire with circular heat-exchange louver. 3,710,094, Cl. 240-9.00a.

Montecatini Edison S.p.A.: *See—*
Cappuccio, Vittorio; Caldo, Cornelio; and Cantatore, Giuseppe, 3,709,839.

Montgomery, James R.: *See—*
Holgate, Richard L.; and Montgomery, James R., 3,710,118.

Montgomery, Ronald Eugene; and Incho, Harry Hobart, to FMC Corporation. Insecticidal compositions and methods of combatting insects using cyclopropanecarboxylate insecticides with a synergistic compound of mono(alkyl and alkenyl) mono-omega-alkynyl-aralkyphosphonate. 3,709,988, Cl. 424-219.000.

Moore, George A. Breading machine. 3,709,193, Cl. 118-19.000.

Moore, George L.: *See—*
Tedeschi, Robert J.; and Moore, George L., 3,709,946.

Moorhead, Walter H. Change speed transmission. 3,709,063, Cl. 74-750.000.

Moran, James J.: *See—*
Watson, William R.; and Moran, James J., 3,710,237.

Moransais, Charles, to Zafira France. Cable-tightening device. 3,709,071, Cl. 81-3.00j.

Morck, Charles W., Jr., to Selas Corporation of America. Safety blowout. 3,709,239, Cl. 137-68.000.

Mori, Kan; Imaizumi, Fumitake; Sato, Hisaya; Nagaoka, Isao; Hirayanagi, Shigetoshi; Shibata, Toru; and Kawatani, Shigeo, to Japan Synthetic Rubber Co., Ltd. Preparation of cis-1,4-polyisoprene. 3,709,851, Cl. 260-94.300.

Morioka, Nagaharu: *See—*
Oda, Nakaaki; Morioka, Nagaharu; Makino, Yoshio; and Yoshida, Akira, 3,709,824.

Moroz, Pavel Kirillovich: *See—*
Belkovsky, Viktor Alexandrovich; Grzhimalsky, Leopold Leopoldovich; Ilievsky, Irma Irmovich; Lotsmanov, Sergei Nikolaevich; Petrunin, Ivan Egorovich; Sukhov, Anatoly Vasilievich; Tikhonov, Boris Sergeevich; Levin, Boris Isaakovich; Moroz, Pavel Kirillovich Strekalov, Genrikh Nikolaevich; Chernov, Andrei Nikolaevich; Chizhov, Sergei Ilich; and Shevyakov, Nikolai Nikolaevich, 3,709,682.

Morress, Harmon F. Controlled reaction underwater power tool. 3,709,305, Cl. 173-30.000.

Morris, Herbert, Limited: *See—*
Davey, Anthony Walter, 3,708,915.
Jennings, Kingsley Jeffrey; and Ward, Frederick Gifford, 3,709,383.

Morris, Philip, Incorporated: *See—*
De Bardeleben, John F., Jr., 3,709,941.

Morris, William W., Sr. Sorting apparatus. 3,709,382, Cl. 214-11.00r.

Morrison, Robert; and MacNeill, James Taylor, to Speedcranes Limited. Cranes. 3,709,375, Cl. 212-58.000.

Morse, Glenn B. Drill press attachment assembly. 3,709,622, Cl. 408-20.000.

Moseley, Corliss Champion. Exercising apparatus for horses. 3,709,197, Cl. 119-29.000.

Moskovsky Zavod Elektrovakuumnykh Priborov: *See—*
Perelman, Simon Meerovich; Petrenko, Evgraf Efremovich; Prager, Isaak Aronovich; Timofeev, Alexandr Andrianovich; and Tolmachev, Anatoly Filippovich, 3,710,166.

Mosley Electronics Inc.: *See—*
French, Gerald H., 3,710,005.

Moss, George J., Jr.; and Walsh, George M., to United States of America, Navy, mesne. System for determining depth of water. 3,710,310, Cl. 340-3.00r.

Motorola, Inc.: *See—*
Bowman, Ronald R., 3,709,695.

Mraz, Hans, to Dunlop Holdings Limited. Extrusion head. 3,709,645, Cl. 425-192.000.

Muck, Gunther: *See—*
Barbacsy, Ludwig Benno; Muck, Gunther; and Plantikow, Ulrich, 3,710,153.

Mueller, Ernst, K.G., Firma: *See—*
Gebhardt, Otto; Luderer, Fred; and Stahlschmidt, Karl-Heinz, 3,709,434.

Mueller, Norman W., to Milwaukee Boiler Mnufacturing Co. Power takeoff interlock. 3,709,046, Cl. 74-15.860.

Mughannam, Adil A.: *See—*
Reimers, James L.; and Mughannam, Adil A., 3,709,352.

Muhlich, Peter: *See—*
Reiff, Karl; and Muhlich, Peter, 3,708,978.

Mulder, Willem: *See—*
Bouman, Antonius Fredericus Mattias; Brands, Antoon Hendrikus; and Mulder, Willem, 3,710,380.

Mullen, Edward K.: *See—*
Carter, Leewood C.; Mullen, Edward K.; and Davanzo, Anthony J., 3,708,813.

Muller, Anton, to Pistor-Kette GmbH. Web link for tire chains. 3,709,275, Cl. 152-243.000.

Muller, Dieter: *See—*
Zahn, Wolfgang; Findeis, Gunter; and Muller, Dieter, 3,709,601.

Munk, Edmund E., to Furnier-und Sperrholzwerk J. F. Werz, Jr., K.G. Apparatus for producing compression-molded articles. 3,709,646, Cl. 425-217.000.

Munson, Robert E., to Ball Brothers Research Corporation. Cavity antenna mounted on a missile. 3,710,338, Cl. 343-708.000.

Munters, Carl Georg: *See—*
Norback, Per Gunnar, 3,708,956.

Murakami, Noboru; Naruto, Tatsuo; and Hashimoto, Nobuyuki, to Aisin Seiki Kabushiki Kaisha. Fluid released clutch controlled by engine speed and gear shiftor. 3,709,340, Cl. 192-3.580.

Murayama, Masayuki; and Abe, Koichi, to Japan Gas-Chemical Company, Inc. Process for purifying hydroxyalkylacrylates or hydroxyalkylmethacrylates by distilling in the presence of poly-alkyleneglycols. 3,709,928, Cl. 260-486.00b.

Murphey, Carey Epps, Jr.: *See—*
Suman, George O., Jr.; Murphey, Carey Epps, Jr.; Richardson, Edwin Allen; and Torrest, Robert Steven, 3,709,299.

Murphy, John. Educational game. 3,708,893, Cl. 35-9.00d.

Murray, Edward J., to Fibra-Sonics, Inc. Multi-dimensional sonic recording and playback devices and method. 3,710,034, Cl. 179-100.1td.

Muth, Karl: *See—*
Welmut, Weber; Weyer, Rudi; Aumuller, Walter; Muth, Karl; and Stach, Kurt, 3,709,908.

Mutsch, Edward L.: *See—*
Fridinger, Tomas L.; Mutsch, Edward L.; and Pauly, David R., 3,709,936.

Myers, Richard Stanley, to RCA Corporation. Regulated ignition system. 3,709,206, Cl. 123-148.00e.

Myhr, Lars Halvar: *See—*
Carlsson, Sixten Einar; Myhr, Lars Halvar; and Svensson, Lars-Ake Erling, 3,709,335.

Nagaoka, Isao: *See—*
Mori, Kan; Imaizumi, Fumitake; Sato, Hisaya; Nagaoka, Isao; Hirayanagi, Shigetoshi; Shibata, Toru; and Kawatani, Shigeo, 3,709,851.

Nagata, Senichi: *See—*
Suda, Toshi; Kobayashi, Hisanori; and Nagata, Senichi, 3,709,639.

Nagatani, Takashi, to Hitachi, Ltd. Energy analyzer of parallel plane type. 3,710,102, Cl. 250-49.5ae.

Nagy, Alex, to Nagy, Betty M. Automatic stripping machine. 3,709,415, Cl. 225-97.000.

Nagy, Betty M.: *See—*
Nagy, Alex, 3,709,415.

Naidenov, Alexandr Ivanovich: *See—*
Dukhovny, Rafael Gershonovich; Magarillo, Boris Lvovich; Naidenov, Alexandr Ivanovich; Ovcharov, Bladimir Vasilievich; and Potapjik, Nikolai Nikolaevich, 3,709,103.

Naito, Shun-Ichi. Aminoethanesulfonyl piperidine and pyrrolidine. 3,709,889, Cl. 260-293.850.

Nakajima, Takashi: *See—*

Okuhara, Akira; Nakajima, Takashi; and Saito, Nobuo, 3,709,802.
Nakamura, Hideo, to Hitachi, Ltd. Data transmitting apparatus in information exchange system using common bus. 3,710,351, Cl. 340-172.500.
Nakamura, Shigeaki: *See—*
Kohashi, Tadao; Nakamura, Tadao; and Nakamura, Shigeaki, 3,710,127.
Nakamura, Tadao: *See—*
Kohashi, Tadao; Nakamura, Tadao; and Nakamura, Shigeaki, 3,710,127.
Nakamura, Takeshi, to Tokyo Shibaura Electric Company, Ltd. Highly sensitive fault localization apparatus capable of locating multiple faults along a section of an electric power transmission line. 3,710,239, Cl. 324-52.000.
Nakamura, Zenkichi: *See—*
Sakai, Yoshio; Nakamura, Zenkichi; and Takahashi, Katsumasa, 3,710,038.
Nakanishi, Michio: *See—*
Goya, Yoshihito; Nakanishi, Michio; Sawatari, Kenichi; Hirose, Akira; and Shinozawa, Tetsuichi, 3,709,674.
Nakano, Yoshiaki, to Nippondenso Kabushiki Kaisha. Voltage changing rate detecting circuit. 3,710,234, Cl. 323-100.000.
Nakatsui, Isamu: *See—*
Kanzaki, Toshihiko; Nakatsui, Isamu; Sugiyama, Yoshio; Nishio, Masaaki; and Ishikawa, Michio, 3,709,787.
Nakaya, Akimichi: *See—*
Kodama, Hisashi; Sekigawa, Tsuneo; Hata, Kazumi; and Nakaya, Akimichi, 3,708,989.
Nakayama, Kiyoshi, to Kyowa Hakko Kogyo Co., Ltd. Process for producing nicotinamide adenine dinucleotide. 3,709,786, Cl. 195-28.00n.
Nalbach, John C., to Nalbach, John R., Engineering Company. Apparatus for assembling closure caps to receptacles. 3,708,854, Cl. 29-208.00b.
Nalbach, John R., Engineering Company: *See—*
Nalbach, John C., 3,708,854.
Nalco Chemical Company: *See—*
Larsonneur, Louis C., 3,709,012.
Vartiak, Joseph F., 3,709,676.
Watson, William R.; and Moran, James J., 3,710,237.
Napoli, Angelo. Vehicle washing apparatus. 3,708,816, Cl. 15-21.00e.
Napper, Mason Wayne, to Galaxie Manufacturing & Sales, Inc. Drill pipe protector. 3,709,569, Cl. 308-4.00a.
Narad, Inc.: *See—*
Kauffman, Robert J., 3,709,161.
Naruto, Tatsuo: *See—*
Murakami, Noboru; Naruto, Tatsuo; and Hashimoto, Nobuyuki, 3,709,340.
Nasica, Jean R., to Intercan S.A. Apparatus for producing containers with complex walls. 3,709,643, Cl. 425-109.000.
Nathansohn, Giangiacomo, to Gruppo Lepetit S.p.A. Pyrazolophthalazinone compounds and process for preparation thereof. 3,709,886, Cl. 260-250.00a.
National Aeronautics and
Space Administration; Acting Administrator; with respect to an invention of:
Butman, Stanley; and Timor, Uzi. Multichannel telemetry system. 3,710,257, Cl. 325-60.000.
Lindsey, William C.; and Simon, Marvin K. Data-aided carrier tracking loops. 3,710,261, Cl. 325-346.000.
National Cash Register Company, The: *See—*
Nelson, Carl R.; Cattorini, Joseph F.; and Terbay, Joseph J., 3,709,482.
National Gypsum Company: *See—*
Kossuth, Donald A.; and Shull, John D., 3,708,935.
National Petro-Chemicals Corporation: *See—*
Krekeler, Jerome H.; Wehr, Charles H.; and Aboutboul, Henri A., 3,709,664.
National Research Development Corporation: *See—*
Sayce, Leonard Alfred; and Jespersen, Knut Indergaard, 3,710,124.
Scales, John Tracey; and Goddar, David, 3,708,805.
National-Standard Company: *See—*
Austin, Max M.; and Boulton, Norman B., 3,709,339.
Nations, Robert L., to Rich Manufacturing Company of Oregon, mesne. Septic tank inlet and outlet fittings. 3,709,527, Cl. 284-110.000.
Neeff, Rutger; and Klauke, Erich, to Farbenfabriken Bayer Aktiengesellschaft. Anthraquinone dyestuffs. 3,709,916, Cl. 260-380.000.
Nelson, Carl R.; Cattorini, Joseph F.; and Terbay, Joseph J., to National Cash Register Company, The. High speed document feeder. 3,709,482, Cl. 271-37.000.
Nelson, Ralph R. Car trunk rack. 3,709,413, Cl. 224-42.10h.
Neu, Helmut: *See—*
Fiebelmann, Peter; Neu, Helmut; and Buzzi, Umberto, 3,709,781.
Neu, Kazuo; and Tochitani, Yutaka, to Yokogawa Electric Works, Ltd. Preferential offering signal processing system. 3,710,326, Cl. 340-172.500.
Neuf, Donald, to RHG Electronics Laboratory, Inc. Parametric amplifier. 3,710,268, Cl. 330-4.900.
Neufeldt, Jacob J. Self-loading refuse vehicle. 3,709,388, Cl. 214-80.000.
New Britain Machine Company, The: *See—*
Stephan, Hallis N.; and Seager, Leslie C., 3,709,623.
Newberry, Sterling P.: *See—*
Smith, Donald O.; Harte, Kenneth J.; Cohen, Mitchell S.; Newberry, Sterling P.; and Speliotis, Dennis E., 3,710,352.
Nicholson Manufacturing Company: *See—*
Cervenak, Peter J., 3,709,269.
Nickel, Horst: *See—*
Ditzer, Reiner; and Nickel, Horst, 3,709,871.
Nicoud, Gilbert, to Societe d'Etudes et de Recherches Magnetiques. Permanent magnet. 3,710,291, Cl. 335-306.000.
Niedrach, Leonard W.; and Bergeron, John A., to General Electric Company. Carbon dioxide sensor. 3,709,812, Cl. 204-195.00p.
Nielsen Engineering and Research Corporation: *See—*
Schwind, Richard G., 3,709,036.
Niesen, George P.; and Yoon, Moo S. Roll end detector. 3,709,604, Cl. 355-64.000.
Nihon Denki Keiki Kenteisho: *See—*
Kusui, Shoji, 3,710,254.
Nikolsky, Leonid Evgenievich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.
Nikulin, Alexandr Alexandrovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.
Nilsson, Per Olof: *See—*
Hessner, Hans; and Nilsson, Per Olof, 3,709,441.
Nippon Denso Kabushiki Kaisha: *See—*
Kawashima, Yoshichi; and Mitsueda, Hisami, 3,710,183.
Nippon Denzai, Ltd.: *See—*
Kawazoe, Toshinobu, 3,710,297.
Nippon Electric Company Limited: *See—*
Ayaki, Kazuo, 3,710,272.
Tomozawa, Atsushi, 3,710,056.
Nippon Kogaku K.K.: *See—*
Kato, Jinichi; and Shimizu, Toshiharu, 3,709,606.
Tsuruta, Tadao, 3,709,605.
Nippon Kokan Kabushiki Kaisha: *See—*
Hano, Masaaki; Kiyotake, Takeshi; and Oike, Minoru, 3,709,423.
Kodama, Hisashi; Sekigawa, Tsuneo; Hata, Kazumi; and Nakaya, Akimichi, 3,708,989.
Tatsumi, Setsuo, 3,709,010.
Nippon Soda Co., Ltd.: *See—*
Oda, Nakaaki; Morioka, Nagaharu; Makino, Yoshio; and Yoshida, Akira, 3,709,824.
Nippondenso Kabushiki Kaisha: *See—*
Higashino, Toshimitsu, 3,710,228.
Nakano, Yoshiaki, 3,710,234.
Suda, Toshi; Kobayashi, Hisanori; and Nagata, Senichi, 3,709,639.
Nishio, Masaaki: *See—*
Kanzaki, Toshihiko; Nakatsui, Isamu; Sugiyama, Yoshio; Nishio, Masaaki; and Ishikawa, Michio, 3,709,787.
Nitschke, Christoph: *See—*
Klementz, Peter; Massat, Heinz; Nitschke, Christoph; and Haubold, Herbert, 3,708,969.
Nixon, James; Wallace, Thomas J.; and Beerbower, Alan, to Esso Research and Engineering Company. Metallized fuel emulsion. 3,709,747, Cl. 149-22.000.
NL Industries, Inc.: *See—*
Dantro, Horace F., 3,709,984.
Nomaguchi, Tamotsu: *See—*
Ito, Toshio; Nomaguchi, Tamotsu; and Tabata, Norikazu, 3,709,473.
Nomura, Raymond S.: *See—*
Watts, John F.; Lang, John M.; Simonson, Alden D.; and Nomura, Raymond S., 3,709,450.
Nonnemacher, Vincent: *See—*
McGough, Gregory J., 3,709,312.
Noponen, Harold W., to General Motors Corporation. Crankcase ventilation. 3,709,204, Cl. 123-119.00b.
Norback, Per Gunnar, to Munters, Carl Georg. Regenerative drier for air to be conditioned. 3,708,956, Cl. 55-20.000.
Nordling, Frederick, to Lynch Communication Systems, Inc. Sampling and retiming circuit for PCM repeaters. 3,710,022, Cl. 178-70.00r.
Nordstrom, John D., to Ford Motor Company. Polyester-siloxane paint. 3,709,956, Cl. 260-827.000.
Norfleet, John H. Scarifier for wall coverings. 3,708,880, Cl. 30-172.000.
Norman Industries, Inc.: *See—*
Brody, Norman M., 3,709,766.

North American Rockwell Corporation: *See—*
Ashcraft, William D., 3,710,384.
Cottrell, George B., 3,710,223.
Lindahl, Charles B., 3,709,982.

Northern Natural Gas Company: *See—*
Hirt, Thomas J.; Kissinger, Richard D.; and Frantzen, Karl H., 3,710,070.

Northrop Corporation: *See—*
Wells, Robert R., 3,708,866.

Northwestern University: *See—*
Jacobs, John E.; and Kovac, Michael G., 3,710,125.

Nortronics Company, Inc.: *See—*
Kronfeld, Alan C.; and Michael, Paul S., 3,710,362.

Notelteirs, Victor Rosallie: *See—*
T'Jampens, Germain Remi; Notelteirs, Victor Rosallie; and Janssen, Eduard Jozef Philomena, 3,710,169.

Nughes, Giovanni. Food storage containers. 3,709,399, Cl. 220-67.000.

Nute, Alton J.: *See—*
Christopher, Charles A., Jr.; Grimm, Henry J.; and Nute, Alton J., 3,709,297.

Nuttall, Roy, to Ferranti, Limited. Semiconductor devices. 3,709,726, Cl. 117-201.000.

Nutter, John F.; Haas, Frank C.; and Thompson, David L., to Oil Shale Corporation, The. Vanadium recovery process. 3,709,974, Cl. 423-63.000.

Nutter, Ralph E., to Cascade Corporation. Apparatus for handling building material sheets and the like. 3,709,547, Cl. 294-67.0aa.

N.V. Bekaert S.A.: *See—*
Wieme, Andre, 3,709,243.

N.V. Hollandse Signaalapparaten: *See—*
Bouman, Antonius Fredericus Mattias; Brands, Antoon Hendrikus; and Mulder, Willem, 3,710,380.

N.V. Leidsche Apparatenfabriek: *See—*
Petiet, Jakobus, 3,709,354.

Obergefell, Ronald F.; and Kish, Edward E., to Houdaille Industries, Inc. Method of and apparatus for generating mist. 3,709,433, Cl. 239-8.000.

Oberloier Enterprises, Inc.: *See—*
Oberloier, John W., 3,708,840.

Oberloier, John W., to Oberloier Enterprises, Inc. Trimming apparatus. 3,708,840, Cl. 29-38.00c.

Occidental Research & Engineering Limited: *See—*
Austin, James, 3,709,675.

Ocean Systems, Inc.: *See—*
Blockwick, Thomas Nicholas, 3,708,982.

Ochiai, Tadashi: *See—*
Matsumoto, Yushi; Ozawa, Tunahiro; Ochiai, Tadashi; and Sakai, Masaomi, 3,709,593.

O'Connor, Joseph, Jr., to Kieley & Mueller, Inc. Control valve and process control system. 3,709,245, Cl. 137-127.000.

Oda, Nakaaki; Morioka, Nagaharu; Makino, Yoshio; and Yoshida, Akira, to Nippon Soda Co., Ltd. Method and composition for chemical polishing of stainless steel surfaces. 3,709,824, Cl. 252-142.000.

Ogle, Robert W., to Lyoflo-Stopper Corporation. Lyoflo-stopper. 3,708,886, Cl. 34-5.000.

Oglesby, Ira D., Jr., to Fort Smith Table and Furniture Co. Folding serving table. 3,709,159, Cl. 108-44.000.

Ohata, Shuichi; Takeuchi, Yoji; and Ishiguro, Takeshi, to Yokogawa Electric Works, Ltd. Highly precise and stable logarithmic circuit. 3,710,089, Cl. 235-193.000.

Ohio State University, The: *See—*
McMaster, Robert C., 3,710,150.

Ohlsson, Leonard W.: *See—*
Clearman, Jack F.; Ohlsson, Leonard W.; and Mackin, Michael H., 3,708,992.

Ohsawa, Mitsuo, to Sony Corporation. Frequency doubler circuit. 3,710,146, Cl. 307-271.000.

Ohshita, Masakazu. Multi-speed transmission front gear mechanism for a bicycle. 3,709,053, Cl. 74-243.00r.

Ohta, Kazuyuki: *See—*
Sada, Tomohiko; Tsuchiya, Noriyuki; Amamiya, Tameo; Kaneda, Yoko; and Ohta, Kazuyuki, 3,710,195.

Ohuchi, Yasushi; Kanamaru, Hisanobu; and Honshima, Teruhisa, to Hitachi, Ltd. Method of producing a molded commutator. 3,708,872, Cl. 29-597.000.

Oike, Minoru: *See—*
Hano, Masaaki; Kiyotake, Takeshi; and Oike, Minoru, 3,709,423.

Oil Shale Corporation, The: *See—*
Nutter, John F.; Haas, Frank C.; and Thompson, David L., 3,709,974.

Oishi, Hiroshi: *See—*
Watanabe, Seizi; Ozaki, Kozo; Oishi, Hiroshi; Aoki, Fumio; and Kawano, Shigeru, 3,710,373.

Ojha, Narayanlal D.: *See—*
Tomalia, Donald A.; and Ojha, Narayanlal D., 3,709,904.

Okamots, Sunao: *See—*
Tani, Kaneyasu; Kawazoe, Shiro; Eto, Mikio; Okamots, Sunao; and Fujino, Tamotsu, 3,709,691.

Okauchi, Tetsuo: *See—*
Kamada, Masaki; and Okauchi, Tetsuo, 3,709,990.

O'Keeffe, Terence W.; and Malmberg, Paul R., to Westinghouse Electric Corporation. Apparatus and method for alignment of members to electron beams. 3,710,101, Cl. 250-49.50t.

Okuhara, Akira; Nakajima, Takashi; and Saito, Nobuo, to Kikkoman Shoyu Co., Ltd. Liquid food decolorization. 3,709,802, Cl. 204-137.00r.

Okuno, Yositosi: *See—*
Matsui, Masanao; Kato, Takeaki; Ueda, Kenzo; Mizutani, Toshio; Kitamura, Shigeyoshi; Fujimoto, Keimei; and Okuno, Yositosi, 3,709,910.

Olbermann, John H., Jr. Flashlight with acessory holder. 3,710,092, Cl. 240-6.40r.

Oldershaw, C. G. Peter; and de Kramer, Don, to General Foods Corporation. Automatic bulk feeding and distributing apparatus. 3,709,351, Cl. 198-37.000.

Olds, Richard G.; and Bonzack, Eugene P., to Westinghouse Electric Corporation, mesne. Power interlock for electronic circuit cards. 3,710,197, Cl. 317-118.000.

Olesen, Larry F.: *See—*
Barba, John J., 3,709,171.

Olesen, Virginia A.: *See—*
Barba, John J., 3,709,171.

Olin Corporation: *See—*
Gambardella, Mario A., 3,709,966.
Thomas, George E.; and Krehel, John J., Jr., 3,708,943.
Zocco, Natale C.; and Cohen, Stanley I., 3,709,843.

Olson, David C., to Lockheed Aircraft Corporation. Towbar apparatus. 3,709,522, Cl. 280-453.000.

Olsson, Erik, A.G.: *See—*
Ruckstuhl, Franz, 3,709,285.

Oltmanns, George F. Container carrier. 3,709,544, Cl. 294-31.200.

Oltmanns, George F. Container carrier. 3,709,545, Cl. 294-31.200.

O'Neil, John E., to Meyers Printing Company. Label sheet and dispensing board. 3,709,763, Cl. 156-584.000.

O'Neill, Damer Evelyn, to Marconi Instruments Limited. Performance checking and measuring devices and methods for signal channels. 3,710,253, Cl. 324-140.00d.

Onishi, Kazuo: *See—*
Takahashi, Tadashi; and Onishi, Kazuo, 3,710,219.

Onsager, Olav-Torgeir: *See—*
Bergem, Norman; Blindheim, Ulf; Onsager, Olav-Torgeir; and Wang, Hagbarth, 3,709,953.

Ontario Cancer Institute: *See—*
Miller, Richard G., 3,709,361.

Opti-Holding AG: *See—*
Frohlich, Alfons; Cappel, Marie-Luise; and Stubiger, Ernst, 3,708,836.

Oravitz, James L., Jr.: *See—*
Dahlberg, John R.; Oravitz, James L., Jr.; and Michalik, Edmund R., 3,709,414.

Orbital Systems Inc.: *See—*
Beltz, John Prickett; and Currie, Harold Burtis, 3,710,322.

Oregon Metallurgical Corporation: *See—*
Lindquist, Jesse L., 3,709,080.

Oregon Research Insitute: *See—*
Rosov, Robert J., 3,708,891.

O'Reilly, Kevin J.: *See—*
Smith, Sydney Edwin; O'Reilly, Kevin J.; and Prydie, John, 3,709,782.

Oriental Photo Industrial Co., Ltd.: *See—*
Tani, Kaneyasu; Kawazoe, Shiro; Eto, Mikio; Okamots, Sunao; and Fujino, Tamotsu, 3,709,691.

Orkin, Stanley S.; and Hartwick, Richard W., to Kacarb Products Corporation, mesne. Split-race bearing construction. 3,709,573, Cl. 308-161.000.

Orlando, Vincent A., to General Motors Corporation. Acceleration responsive sensor. 3,710,051, Cl. 200-61.45r.

Orshansky, Elias, Jr., to Urs Systems Corporation. Narrow range hydromechanical transmission. 3,709,060, Cl. 74-687.000.

Orshansky, Elias, Jr., to Urs Systems Corporation. Non-regenerative hydromechanical transmission. 3,709,061, Cl. 74-687.000.

Osaka Soda Co., Ltd.: *See—*
Takikawa, Toshio; Satomo, Kouji; and Kodama, Takashi, 3,709,777.

Osaka Transformer Co., Ltd., The: *See—*
Oyachi, Toshio, 3,710,188.

Osaka Yogyo Kabushiki Kaisha: *See—*
Ao, Takeo, 3,709,832.

Osakada, Atsushi: *See—*
Minami, Satoyuki; Shinke, Yoshiaki; Saito, Ahozi; and Osakada, Atsushi, 3,709,806.

Osborn-Mushet Tools Limited: *See—*
Hibbert, Charles; Kirk, Frederick Arthur; Siddall, Keith; and Howard, Michael Roi, 3,709,628.

Ostertag, Hubert L., to Miller, Herman, Inc. Bias relieved automatic seat return. 3,709,555, Cl. 297-142.000.

Otsuka Pharmaceutical Company, Limited: *See—*
Mima, Masahiko, 3,709,986.

Otsuka, Shinichiro; Honda, Takeshi; and Yamanoi, Akio, to Ajinomoto Co., Inc. Method of producing L-tyrosine by fermentation. 3,709,785, Cl. 195-29.000.

Otto Meinel-Georgadel Metallwarenfabrik: *See—*
Hollerl, Alois; and Landgraf, Karl, 3,709,320.

Outboard Marine Corporation: *See—*
Brown, Peter W., 3,709,202.
Lassanske, George G., 3,709,052.

Ovcharov, Bladimir Vasilievich: *See—*

Dukhovny, Rafael Gershonovich; Magarillo, Boris Lvovich; Naidenov, Alexandr Ivanovich; Ovcharov, Bladimir Vasilievich; and Potapjik, Nikolai Nikolaevich, 3,709,103.

Owens-Corning Fiberglas Corporation: *See—*
Kissell, Ronald E.; and Gambill, Ulysses T., 3,709,076.

Owens-Illinois, Inc.: *See—*
Amsden, Carl D.; and Galeano, Sergio F., 3,709,975.
Doucette, Eugene F., 3,708,950.
Hagedorn, Erwin C., 3,709,705.
Karabinos, Joseph V.; Leopold, Karl M.; and Doherty, William P., 3,709,867.
Kontz, Robert F., 3,709,440.
Thomas, Ian M., 3,709,833.

Oxendine, Joseph W., Jr.; Happs, Gary J.; and Keltie, Dale A., to Filper Corporation. Voting machine and method. 3,710,105, Cl. 235-54.00f.

Oyachi, Toshio, to Osaka Transformer Co., Ltd., The. High tension network distribution system. 3,710,188, Cl. 317-26.000.

Ozaki, Kozo: *See—*
Watanabe, Seizi; Ozaki, Kozo; Oishi, Hiroshi; Aoki, Fumio; and Kawano, Shigeru, 3,710,373.

Ozawa, Tunahiro: *See—*
Matsumoto, Yushi; Ozawa, Tunahiro; Ochiai, Tadashi; and Sakai, Masaomi, 3,709,593.

Pace, Brian, to Decca Limited. Receivers for phase comparison radio navigation systems. 3,710,334, Cl. 343-105.00r.

Packaging Corporation of America: *See—*
Estes, Timothy K.; De Winter, Frank G. V.; Doss, John L.; and Higgins, James J., 3,708,929.

Packo, Joseph J.: *See—*
Rossman, Joseph, 3,709,712.

Padawer, Gerald M. Lithium nuclear microprobe. 3,710,113, Cl. 250-83.30r.

Padgitt, Howard R.: *See—*
Vandenberg, Willard J.; Chae, Hi Chul; Stewart, Elmer R.; Palmer, Wayne R.; and Padgitt, Howard R., 3,709,598.

Paepke, Horst, to Warner & Swasey Company, The. Cam box for knitting machine. 3,709,004, Cl. 66-57.000.

Palazzetti, Mario: *See—*
Michellone, Giancarlo; Palazzetti, Mario; and Tabasso, Giovanni, 3,709,566.

Pall Corporation: *See—*
Riely, Phyllis, 3,709,221.
Rosenberg, David, 3,709,636.

Palmer, Wayne R.: *See—*
Vandenberg, Willard J.; Chae, Hi Chul; Stewart, Elmer R.; Palmer, Wayne R.; and Padgitt, Howard R., 3,709,598.

Palmour, Harold H., to Armco Steel Corporation. Power fluid conditioning unit. 3,709,292, Cl. 166-68.000.

Paltier Corporation, The: *See—*
Blozis, Peter P., 3,709,165.
Skubic, Leroy F., 3,709,164.

Pandel-Bradford, Inc.: *See—*
Wisotzky, Reuben; and Petersen, Richard E., 3,709,752.

Papadopoulos, John; Prince, David A.; and Reilly, Roger F., to International Business Machines Corporation. Method of and apparatus for selective solder reflow. 3,710,069, Cl. 219-85.000.

Papajewski, Reinhold; and Gillessen, Erich, to Singer Company, The, mesne. Underbed thread trimming mechanism for sewing machines. 3,709,176, Cl. 112-252.000.

Papanicolaou, John Paul; and Galati, Telemachus Nicolas, to Marine and Industrial Developments Limited. Cargo vessels. 3,709,181, Cl. 114-72.000.

Pappas, Jimmy P.: *See—*
Cettin, Edward J.; Pappas, Jimmy P.; and Lager, Sam E., 3,709,203.

Paramount Textile Machinery Co.: *See—*
Goellner, Willy J., 3,709,075.

Parker, Robert H.: *See—*
Cherry, James R.; Crow, Joseph W.; and Parker, Robert H., 3,710,383.

Parker-Hannifin Corporation: *See—*
Mains, Robert T., 3,709,529.

Parks, Howard L., to Bunker-Ramo Corporation, The. Method of making a batch fabricated magnetic memory. 3,708,874, Cl. 29-604.000.

Parmenter, Robert R.: *See—*
Snyder, Richard C.; Parmenter, Robert R.; and Suvada, Steve L., 3,709,157.

Partlow, William D.: *See—*
Hopkins, Richard H.; Roland, George W.; Partlow, William D.; and Steinbruegge, Kenneth B., 3,710,278.

Paschkis, Albert E.: *See—*
Highley, Thomas T., Jr.; and Paschkis, Albert E., 3,710,342.

Pashak, John F.: *See—*
Koeplinger, Ronald D.; Pashak, John F.; and Foerster, George S., 3,709,745.

Passavant Werke: *See—*
Auler, Herbert; and Josef, Muskat, 3,709,470.

Passavant-Werke: *See—*
Fechter, Leonhard, 3,709,370.

Pate, James Ronald, to International Telephone and Telegraph Corporation. Mounting structure for use in luminaire. 3,710,130, Cl. 250-239.000.

Patel, Hiralal V., to Weatherhead Company, The. Method of forming a weld fitting. 3,708,864, Cl. 29-479.000.

Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich. Multiple electrode electroslag casting apparatus having current equalizer. 3,709,283, Cl. 164-252.000.

Pauly, David R.: *See—*
Fridinger, Tomas L.; Mutsch, Edward L.; and Pauly, David R., 3,709,936.

Pavlik, William R., to Republic Steel Corporation. Method and apparatus for X-ray interrogation of a sample. 3,710,104, Cl. 250-51.500.

Pavnica, Cyril A.: *See—*
Folk, Dennis L.; and Pavnica, Cyril A., 3,708,951.

Pawelek, Alex: *See—*
Lahde, Reinhard N.; and Pawelek, Alex, 3,710,086.

Pawsat, Carlton P., to Wald Manufacturing Company, Inc. Cycle pedal with anchored reflector. 3,709,059, Cl. 74-574.000.

Pax, Wilhelmus Petrus Johannes Franciscus; and Rooy, Henricus Johannes Van, to U.S. Philips Corporation. Deflection coil. 3,710,289, Cl. 335-213.000.

Payen, Jean-Pol, to Merlin Gerin, Societe Anonyme. Electrical distribution and current collecting assembly for high speed drive arrangements. 3,709,337, Cl. 191-22.00r.

Payne, Peter R., to Wyle Laboratories. High speed boat. 3,709,179, Cl. 114-66.50p.

Peche, Gerhard, to Siemens Aktiengesellschaft. Overvoltage arrester with several electrodes. 3,710,191, Cl. 317-62.000.

Peck & Hale, Inc.: *See—*
Last, Walter A., 3,709,455.

Peisner, Israel D.; Deshetler, Louis K.; and Augustine, Paul C., to Whitehead & Kales Company. Protective side panel inst ation for rail car. 3,709,154, Cl. 105-368.00r.

Peloschek, Hans Peter: *See—*
Ritzen, Johannes Maria Jozef; and Peloschek, Hans Peter, 3,709,822.

Peltola, Ronald W.: *See—*
Addis, John L.; and Peltola, Ronald W., 3,710,270.

Pennington, Grover B.: *See—*
Smart, David Ol, IV; Pennington, Grover B.; Plettner, Richard M.; and Maughan, Robert F., 3,709,363.

Pennwalt Corporation: *See—*
Dohany, Julius Eugene; and Grigger, John Casimer, 3,709,856.
King, James Ping, 3,709,721.

Perelman, Simon Meerovich; Petrenko, Evgraf Efremovich; Prager, Isaak Aronovich; Timofeev, Alexandr Andrianovich; and Tolmachev, Anatoly Filippovich, to Moskovsky Zavod Elektrovakuumnykh Priborov. Gas-filled ionization counter. 3,710,166, Cl. 313-93.000.

Perrine, Walter E. Adjustable hesitation blow back operated gun toggle mechanism. 3,709,091, Cl. 89-189.000.

Perry, Robert H., to Westinghouse Electric Corporation. Vehicle movement control and detection method and apparatus. 3,710,100, Cl. 246-28.00r.

Persson, Erland K., to Electro-Craft Corporation. Coupling. 3,709,000, Cl. 64-13.000.

Peters, Philip H., Jr., to Environment/One Corporation. Metal base cookware induction heating apparatus having improved power supply and gating control circuit using infra-red temperature sensor and improved induction heating coil arrangement. 3,710,062, l. 219-10.049.

Petersen, Richard E.: *See—*
Wisotzky, Reuben; and Petersen, Richard E., 3,709,752.

Peterson, Edward C.; and Davis, Ernest E., to Rolling Mill Engineers, Inc. Roller guide. 3,709,346, Cl. 193-35.0c.

Peterson, Ernest W., to Ralston Purina Company. Multi-purpose cooker. 3,709,142, Cl. 99-357.000.

Peterson, Norman L.; and Buelow, William H., to Rex Chainbelt Inc. Mixing timer. 3,710,217, Cl. 318-470.000.

Peterson, Wayne A.; and Wirtz, Edward A., to Caterpillar Tractor Company. Hydraulic implement control circuit. 3,709,100, Cl. 91-189.000.

Peterson, Wesley G., to Sola Basic Industries, Inc. Sensitive ground fault meter and detector utilizing a double side band frequency current generator. 3,710,238, Cl. 324-51.000.

Pethis, James J., to Textron, Inc. Reversible shield-seal for a bearing. 3,709,572, Cl. 308-187.200.

Petiet, Jakobus, to N.V. Leidsche Apparatenfabriek. Positioning device for conical subjects. 3,709,354, Cl. 198-33.0aa.

Petrenko, Evgraf Efremovich: *See—*
Perelman, Simon Meerovich; Petrenko, Evgraf Efremovich; Prager, Isaak Aronovich; Timofeev, Alexandr Andrianovich; and Tolmachev, Anatoly Filippovich, 3,710,166.

Petrie, James Alexander; Gardiner, Terence Edward Gouvenot; and Clampitt, John Aaron, to United Kingdom of Great Britan and Northern Ireland, Secretary of State for Defense in her Britannic Majesty's Government of the. Gas turbine engines. 3,709,637, Cl. 47-405.000.

Petrunin, Ivan Egorovich: *See—*

Belkovsky, Viktor Alexandrovich; Grzhimalsky, Leopold Leopoldovich; Ilievsky, Irma Irmovich; Lotsmanov, Sergei Nikolaevich; Petrunin, Ivan Egorovich; Sukhov, Anatoly Vasilievich; Tikhonov, Boris Sergeevich; Levin, Boris Isaakovich; Moroz, Pavel Kirillovich Strekalov, Genrikh Nikolaevich; Chernov, Andrei Nikolaevich; Chizhov, Sergei Ilich; and Shevyakov, Nikolai Nikolaevich, 3,709,682.

Petsch, Ernst, to Maschinenfabrik Sack GmbH. Extrusion press for rod or tube. 3,709,013, Cl. 72-22.000.

Pettibone Corporation: *See—*
Kaszuba, Robert J., 3,708,920.

Pevzner, Semen Albertovich: *See—*
Isaev, Alexei Ilich; Pevzner, Semen Albertovich; and Zemtsov, Jury Semenovich, 3,708,919.

Pfannkuch, Heinrich; Saxberger, Adolf; and Schnebel, Fritz. Covering device for skylights. 3,709,583, Cl. 350-260.000.

Pfeiffer, Richard D. Method for assembling a differential. 3,708,857, Cl. 29-407.000.

Pfizer Inc.: *See—*
Leeming, Peter R.; Cross, Peter E.; Cox, David A.; and Augstein, Joachim, 3,709,892.

Philadelphia Quartz Company: *See—*
Weldes, Helmut H., 3,709,837.

Philco Ford Corporation: *See—*
Houghton, Norman F., 3,709,968.

Philco-Ford Corporation: *See—*
Bray, Ralph; and Rowan, Clement W., 3,710,143.

Phillips Petroleum Company: *See—*
Boultinghouse, Harold D., 3,709,771.
Burleigh, John E., 3,709,958.
Clark, Ernest E., 3,709,307.
Dunn, Howard E., 3,709,955.
Fluegel, Dale A., 3,710,376.
Fox, Homer M., 3,709,800.
Harrison, Roy C.; and Crain, Donald L., 3,709,850.
Held, Edward C., Jr., 3,709,967.
Hutson, Thomas, Jr.; and Ritter, Ronald E., 3,709,951.
Stapp, Paul R., 3,709,923.
Windle, Tom J., 3,709,260.

Pietsch, Raymond L., to Engineered Products Company, The. Mounting structure for mirrors and the like. 3,709,456, Cl. 248-475.000.

Piffath, Rodney S.; and Cole, John J., to Butana Match A.G. Slit regulator for gas lighter. 3,709,462, Cl. 251-118.000.

Piker, Herbert M.; and Borum, Otis C., to Farenwald Enterprises, Inc., mesne. Boat and trailer. 3,709,178, Cl. 114-56.000.

Pilkington Brothers Limited: *See—*
Andrews, Brian; Pilkington, James Christopher; and Riley, Brian William, 3,709,358.

Pilkington, James Christopher: *See—*
Andrews, Brian; Pilkington, James Christopher; and Riley, Brian William, 3,709,358.

Pinney, Wesley W.: *See—*
Mahaffy, Reid A.; Hamilton, Joel A.; and Pinney, Wesley W., 3,709,702.

Pipa, Anatoly Vasilievich: *See—*
Bomko, Vasily Alexeevich; Revutsky, Evgeny Ivanovich; Rudiak, Boris Ivanovich; and Pipa, Anatoly Vasilievich, 3,710,163.

Piret, Jean: *See—*
Lombard, Claude; and Piret, Jean, 3,709,070.

Pistor-Kette GmbH: *See—*
Muller, Anton, 3,709,275.

Pitroda, Satyan G., to GTE Automatic Electric Laboratories Incorporated. Detector for digitally transmitted multifrequency tones as utilized for signaling in a pulse modulated telephone system. 3,710,028, Cl. 179-15.0by.

Pitt, Larry L.; and Starbuck, James W., to Mallinckrodt Chemical Works. Haloapatite phosphors in the form of spherical particles and method of making same. 3,709,826, Cl. 252-301.40p.

Pitzer, Kenneth H., to Adjustable Bushing Corporation. Quick acting, high tensile, blind fastener. 3,709,088, Cl. 85-74.000.

Place, Harold G.: *See—*
Baker, Ralph W.; McCarthy, John H.; Place, Harold G.; and Wikman, Andrew O., 3,709,950.

Placements Jean Paul Tanguay Limitee, mesne: *See—*
Tanguay, Jean Paul, 3,709,265.

Placements Jean Paul Tanguay Ltee, mesne: *See—*
Tanguay, Jean Paul, 3,709,390.

Plantikow, Ulrich: *See—*
Barbacsy, Ludwig Benno; Muck, Gunther; and Plantikow, Ulrich, 3,710,153.

Plastigage Corporation: *See—*
Medler, Albert, 3,709,754.

Plempel, Manfred: *See—*
Draber, Wilfried; Regel, Erik; Buchel, Karl-Heinz; and Plempel, Manfred, 3,709,901.

Plessey Handel und Investments A.G.: *See—*
Lee, Martin David, 3,710,147.

Plettner, Richard M.: *See—*
Smart, David Ol, IV; Pennington, Grover B.; Plettner, Richard M.; and Maughan, Robert F., 3,709,363.

Plexowood, Inc.: *See—*
Habgood, Robert P., Jr., 3,709,326.

Plummer, William T., to Polaroid Corporation. Method and apparatus for aligning a viewing system. 3,709,131, Cl. 95-39.000.

Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See—*
Boissin, Jean, 3,709,051.

Podzimek, Karel: *See—*
Jurasek, Jaromir; Mikac, Mojimar; and Podzimek, Karel, 3,708,815.

Pogonowski, Ivo C.; and Carmichael, Paul D., to Texaco Inc. Articulated marine platform. 3,708,985, Cl. 61-46.500.

Pohl, Fritz G.; and Keller, Arnold, to Howmet International, Inc. Pneumatic motor for medical instruments. 3,709,630, Cl. 415-199.000.

Pokhodnya, Igor Konstantinovich; Shlepakov, Valery Nikolaevich; and Alter, Vladimir Fedorovich, to Institut Elektrosvarki Imeni E.O. Patonia Akademii. Welding wire. 3,710,073, Cl. 219-146.000.

Polaroid Corporation: *See—*
Blinow, Igor; and Leduc, Robert D., 3,709,122.
Bloom, Stanley M.; and Farney, Leonard C., 3,709,693.
Douglas, Lawrence M., 3,709,130.
Farrell, George J.; Lyon, Walter R.; Mills, Loring K.; and Shaw, Reginald O., 3,709,132.
Forsyth, Robert P., 3,709,022.
La Rocca, Salvatore, 3,709,597.
Land, Edwin H., 3,709,588.
Land, Edwin H., 3,709,687.
Plummer, William T., 3,709,131.

Poletti, Henri: *See—*
Pruvot, Francois C.; and Poletti, Henri, 3,709,093.

Poletti, Joseph W.: *See—*
Cronkhite, Paul W.; Voege, Robert D.; and Poletti, Joseph W., 3,708,921.

Polikarpov, Vladimir Vasilievich: *See—*
Lukhovitsky, Vladimir Isaakovich; Smirnov, Andrei Mikhailovich; Polikarpov, Vladimir Vasilievich; Lebedeva, Alla Mikhailovna; Lagucheva, Raisa Mizovna; and Karpov, Vladimir Lvovich, 3,709,804.

Polkinghorn, Melvin W.: *See—*
Burgess, James P.; Polkinghorn, Melvin W.; and Dieterle, Gunther, 3,710,049.

Polkinghorn, Melvin William: *See—*
Brzozowski, Stephen Joseph; and Polkinghorn, Melvin William, 3,710,047.

Pollak, Henry Otto: *See—*
Graham, Rooonald Lewis; and Pollak, Henry Otto, 3,710,026.

Pollitt, James, to Rolls-Royce Limited. Velocity monitor for aircraft. 3,709,033, Cl. 73-178.00t.

Pool, Clarence. Agitator for moving fluid suspended objects through abrasive motions. 3,708,918, Cl. 51-3.000.

Popov, Viktor Andreevich: *See—*
Medovar, Boris Izrailevich; Popov, Viktor Andreevich; Alferov, Jury Fedorovich; Bogachenko, Alexey Georgievich; and Latash, Jury Vadimovich, 3,709,997.

Portec, Inc.: *See—*
Steltz, Douglas C., 3,709,389.

Poshkus, Algirdas C.: *See—*
Herweh, John E.; and Poshkus, Algirdas C., 3,709,844.

Potapjik, Nikolai Nikolaevich: *See—*
Dukhovny, Rafael Gershonovich; Magarillo, Boris Lvovich; Naidenov, Alexandr Ivanovich; Ovcharov, Bladimir Vasilievich; and Potapjik, Nikolai Nikolaevich, 3,709,103.

Potter, Howell L., to Textron, Inc. Locking device for a bearing or the like. 3,709,574, Cl. 308-236.000.

Poupin, Raymond: *See—*
Flesselles, Jacques; and Poupin, Raymond, 3,709,350.

Povey, Edmund H., to Doble Engineering Company. Service bushing test. 3,710,242, Cl. 324-54.000.

Powell, B. J.: *See—*
Lee, Maw-Heul, 3,710,032.

Powell, Edgar S., Jr. Method of stringing beads. 3,708,862, Cl. 29-433.000.

Powell, Joan E.: *See—*
Powell, William C., 3,710,318.

Powell, William C.; deceased (by Powell, Joan E.; administratrix), to Honeywell Information Systems Inc. Error detection circuit. 3,710,318, Cl. 340-146.1ab.

Powers, Samuel P., to Pulsar Corporation. Intermittent traction device. 3,709,217, Cl. 128-75.000.

PPG Industries, Inc.: *See—*
Bishop, Hugh S., 3,709,673.
Chisholm, Raymond S., 3,709,980.
Dahlberg, John R.; Oravitz, James L., Jr.; and Michalik, Edmund R., 3,709,414.
Stewart, John L., 3,710,074.

Prager, Isaak Aronovich: *See—*
Perelman, Simon Meerovich; Petrenko, Evgraf Efremovich; Prager, Isaak Aronovich; Timofeev, Alexandr Andrianovich; and Tolmachev, Anatoly Filippovich, 3,710,166.

Pramann, James A., to Shell Oil Company. Sand pack-aided formation sand consolidation. 3,709,298, Cl. 166-276.000.

Predikant, Hans H., to Universal Oil Products Company. Process for purifying industrial waste gases containing hydrogen fluoride. 3,709,978, Cl. 423-240.000.

Preiser, Ralph H.; Goodwin, Clarence J.; and Cofoid, Robert D., to General Time Corporation. Comfort humidity indicator. 3,709,039, Cl. 73-336.000.

Prescott, William Benjamin: *See—*

Grethlein, Hans Erich; and Prescott, William Benjamin, 3,710,345.
Price, Arthur Burke: *See—*
Cross, Donald John; Eckenbrecht, Robert Roy; Price, Arthur Burke; and Scott, Benton boyd, 3,710,012.
Price, Raymond R., to Rochester Silo Co. Double passage silo chute. 3,709,345, Cl. 193-34.000.
Priede, Bruno Andreevich: *See—*
Abramov, Viktor Petrovich; Junga, Yan Petrovich; Berzin, Gunard Valdemarovich; Skrupsky, Voldemar Petrovich; Frolov, Petr Nikolaevich; Lugovskoi, Andrei Lukyanovich; Shilgorin, Felix Alexandrovich; Dalbinsh, Yan Yanovich; Rotsen, Karl Arturovich; Ziemelis,Andris Eduardovich; Elksnis, Artur Yanovich; and Priede, Bruno Andreevich, 3,709,270.
Priest, Lyle Gilbert, to Information Design, Inc. Apparatus for positioning film or tape wound on reel. 3,710,221, Cl. 318-467.000.
Prince Corporation: *See—*
Cain, Wayne R.; Marcus, Konrad H.; and Prince, Edgar D., 3,708,828.
Prince, David A.: *See—*
Papadopoulos, John; Prince, David A.; and Reilly, Roger F., 3,710,069.
Prince, Edgar D.: *See—*
Cain, Wayne R.; Marcus, Konrad H.; and Prince, Edgar D., 3,708,828.
Pringle, William L., to Pullman Incorporated. Automobile hold-down device. 3,709,155, Cl. 105-368.00r.
Process Technologists International; division of Trinity, Inc.: *See—*
Christopher, William H., Jr.; Meyers, Charles O.; and Whipple, Jack C., Jr., 3,708,960.
Procter & Gamble Company, The: *See—*
Crossley, Guy A.; and Heckert, David C., 3,709,831.
Kaminsky, George J.; and Laughlin, Robert G., 3,709,942.
Proell, Wayne A.; Selin, Clifford E.; Holbrook, Stanford T.; and Hammond, Francis H., to American Hydrocarbon Company. Oxidation process employing nitric acid catalysis for the preparation of humates from coal. 3,709,931, Cl. 260-515.00h.
Projain, Richard J.: *See—*
Greenberg, Sol; Gold, Robert D.; and Projain, Richard J., 3,710,193.
Prolizenz AG: *See—*
Bolliger, Martin, 3,709,281.
Prontor-Werk Alfred Gauthier G.m.b.H.: *See—*
Straub, Helmut, 3,709,136.
Prontor-Werk Alfred Gauthier G.m.b.H. H.: *See—*
Starp, Franz W. R., 3,709,137.
Propst, Billy J.: *See—*
Kirby, Robert A.; and Propst, Billy J., 3,710,259.
Provident National Bank: *See—*
Rossman, Joseph, 3,709,712.
Pruess, Dietrich: *See—*
Grin, Michel; and Pruess, Dietrich, 3,708,865.
Prugger, David K.: *See—*
Lawyer, John F.; and Prugger, David K., 3,709,319.
Pruitt, William H., to Texaco Inc. Method and apparatus for skimming a light liquid from the surface of a body of heavier liquid. 3,709,366, Cl. 210-242.000.
Prunchak, John. Windshield blade reconditioner. 3,708,924, Cl. 51-205.00r.
Pruss, Gunther Manfred Wolfgang. Play, sports and training apparatus. 3,709,490, Cl. 273-29.00a.
Pruvot, Francois C.; and Poletti, Henri. Method of cutting gear teeth of homokinetic joints of hydraulic pumps and motors. 3,709,093, Cl. 90-8.000.
Prydie, John: *See—*
Smith, Sydney Edwin; O'Reilly, Kevin J.; and Prydie, John, 3,709,782.
Pullman Incorporated: *See—*
Gutridge, Jack E., 3,709,152.
Pringle, William L., 3,709,155.
Snyder, Richard C.; Parmenter, Robert R.; and Suvada, Steve L., 3,709,157.
Pulsar Corporation: *See—*
Powers, Samuel P., 3,709,217.
Putnam, James A., to United Aircraft Corporation. FET driver for capacitive loads. 3,710,271, Cl. 330-35.000.
Pye, David S., to Union Oil Company of California. Hydraulic fracturing process. 3,709,300, Cl. 166-280.000.
Quadri, Syed H.: *See—*
Monte, Ernest; and Quadri, Syed H., 3,710,094.
Quaker Oats Company, The: *See—*
Doe, Walter P., 3,708,912.
Quebec Iron and Titanium Corporation: *See—*
Beerman, Ludovicus Johannes, 3,709,506.
Quehl, Dr., & Co., GmbH: *See—*
Flugel, Wilhelm, 3,709,940.
Quentin, Jean-Pierre, to Rhone-Poulenc S.A. Sulfonated polyarylethersulfones. 3,709,841, Cl. 260-2.20r.
Quilici, Alfred P.; and Wilson, Warren F. Warning system for automobile trailer hitches. 3,710,370, Cl. 340-275.000.
Quinney, James L., to Idaho Bank of Commerce. Method of making firearms having interchangeable barrels. 3,708,841, Cl. 29-1.100.
Quirk, John B.: *See—*
Jackson, Arthur L.; Jolly, Shelby A.; and Quirk, John B., 3,710,144.
Quis, Peter: *See—*
Gruber, Wilhelm; Kleine-Doepke, Wolfgang; Quis, Peter; and Schroeder, Guenther, 3,709,934.
Radiation and Environmental Materials, Inc.: *See—*
Warren, Gary J.; and Babcock, Gordon L., 3,710,107.
Radiation Incorporated: *See—*
Scambi, Attilio F., Jr., 3,710,341.
Radiation Technology, Inc.: *See—*
Welt, Martin A., 3,709,719.
Radtke, Joseph D.; and Kiffmeyer, William W., to Allen-Bradley Company. Analog to digital converter. 3,710,378, Cl. 340-347.0ad.
Raichuk, Jury Isaakovich; Knyazhinsky, Zakhar Osipovich; Mandelberg, Simon Lvovich; Lebedev, Vladimir Konstantinovich; and Volkov, Viktor Nikolaevich. Method of electric-arc welding of tubular products with magnetic control of the arc. 3,710,066, Cl. 219-6.000.
Ralston Purina Company: *See—*
Peterson, Ernest W., 3,709,142.
Ramge, Dennis Lee: *See—*
Hite, Edward Lee; Ramge, Dennis Lee; and Roelf de Muinck, Andre, 3,709,327.
Ransburg GmbH: *See—*
Von Gottberg, Horst; Schaefer, Gerd; and Joerns, Guenter, 3,709,190.
Ranta, Esko E.: *See—*
Martin, William F.; and Ranta, Esko E., 3,709,449.
Rapistan Incorporated: *See—*
Sullivan, Norman M.; and Fitzgerald, Francis J., Jr., 3,709,381.
Rascioni, Vinicio; and Gianini, Giovanni, to Contraves Italiana S.p.A. Support means for optical sighting instrument. 3,709,617, Cl. 356-247.000.
Rauchwerger, George P. Capacitance probe for detecting moisture with very long cables. 3,710,244, Cl. 324-61.00r.
Rawson, Harry H. Replaceable roll assembly. 3,708,844, Cl. 29-123.000.
Raymond, Robert E., to International Basic Economy Corporation. Hydraulic power unit. 3,708,977, Cl. 60-52.0us.
Raytheon Company: *See—*
Banks, Donald S., 3,710,388.
Cignoni, Edward P., Jr., 3,710,199.
Gicca, Francis A., 3,710,255.
Williamson, Robert T.; and Georgopoulos, Christos J., 3,710,145.
RCA Corporation: *See—*
Alphonse, Gerard Argant, 3,710,283.
Dresner, Joseph; and Goodman, Alvin Malcolm, 3,710,167.
Gallager, Jacob Boon, Jr., 3,710,303.
Leidich, Arthur John; and Malchow, Max Edward, 3,710,202.
Myers, Richard Stanley, 3,709,206.
Volmerange, Hubert Marie, 3,710,140.
Re Jo Multi Colour, Inc.: *See—*
Jacobs, John J., 3,709,742.
Reber, Walter, to Societe Kuhn Freres & Cie, Societe en Commandit Simple. Agricultural machine rotor-type cutting mechanism. 3,708,966, Cl. 56-6.000.
Recognition Equipment Incorporated: *See—*
Meyer, Alton H.; and Monday, William C., 3,709,481.
Recrosio, Agostino: *See—*
Cogliati, Guido; Recrosio, Agostino; and Lanz, Renato, 3,709,963.
Redding, Wilford A. Auxiliary retention for a C-washer. 3,709,530, Cl. 287-52.070.
Rederiaktiebolaget Nordstjernan: *See—*
Jonsson, Per Hjalmar, 3,709,616.
Regel, Erik: *See—*
Draber, Wilfried; Regel, Erik; Buchel, Karl-Heinz; and Plempel, Manfred, 3,709,901.
Regie Nationale des Usines Renault: *See—*
Lombard, Claude; and Piret, Jean, 3,709,070.
Rehmar, Solomon Jacob, to Construction Techniques, Inc. Attrition resistant granules, method of making the same and cementitious grout and concrete compositions containing the same. 3,709,707, Cl. 106-87.000.
Reich, Karl M., Maschinenfabrik: *See—*
Mohr, Johannes; and Cast, Adolf, 3,709,328.
Reichardt, Mayo M.: *See—*
Meyer, Howard M.; and Reichardt, Mayo M., 3,708,849.
Reif, Philip George, to International Telephone and Telegraph Corporation. Resolution enhancement of image intensification systems. 3,710,126, Cl. 250-213.0vt.
Reiff, Karl; and Muhlich, Peter, to Bosch, Robert, G.m.b.H. Regulating apparatus for axial piston machines or the like. 3,708,978, Cl. 60-53.00r.
Reilly, Roger F.: *See—*
Papadopoulos, John; Prince, David A.; and Reilly, Roger F., 3,710,069.
Reimers, James L.; and Mughannam, Adil A., to FMC Corporation. Multiple pitch processing conveyor. 3,709,352, Cl. 198-131.000.
Reisacher, Josef, to Daimler-Benz Aktiengesellschaft. Cooling water conduit system in internal combustion engines. 3,709,200, Cl. 123-41.820.
Reliance Electric Company: *See—*

Williams, Roger B., Jr.; Loshbough, Richard C.; and Deitemeyer, Stanley A., 3,709,309.

Renault, Philippe: *See—*
Deschamps, Andre; Franckowiak, Sigismond; Gatellier, Claude; Gltkmans, Georges; and Renault, Philippe, 3,709,784.

Republic Steel Corporation: *See—*
Pavlik, William R., 3,710,104.

Requardt, Heiko: *See—*
Spengler, Erich; Boning, Horst; and Requardt, Heiko, 3,709,609.

Research Corporation: *See—*
Tabb, Durbin C., 3,709,195.
Walsh, William Kershaw; and Rutherford, Henry Ames, 3,709,658.

Research Corporation, mesne: *See—*
Klemm, Le Roy H.; Johnson, Wayne O.; and White, Danny V., 3,709,894.
Klemm, Le Roy H.; Johnson, Wayne O.; and White, Danny V., 3,709,994.

Revutsky, Evgeny Ivanovich: *See—*
Bomko, Vasily Alexeevich; Revutsky, Evgeny Ivanovich; Rudiak, Boris Ivanovich; and Pipa, Anatoly Vasilievich, 3,710,163.

Rex Chainbelt Inc: *See—*
Johnson, Norman S., 3,709,086.
Peterson, Norman L.; and Buelow, William H., 3,710,217.

Rexham Corporation, mesne: *See—*
Schulze, James R.; and Soroka, Joe F., 3,708,952.

Reynolds Metals Company: *See—*
Goolsby, Patrick F., 3,710,152.

Reynolds, R. J., Tobacco Company: *See—*
Leffingwell, John Charles, 3,709,890.

Rhee, Dong Woo, to GTE Sylvania Incorporated. Current drive deflection apparatus utilizing constant current generator. 3,710,171, Cl. 315-2.0td.

RHG Electronics Laboratory, Inc.: *See—*
Neuf, Donald, 3,710,268.

Rhine, Wallace R.; and Kiser, Fred W., to Timesavers, Inc., mesne. Buffing and deburring machine. 3,708,817, Cl. 15-77.000.

Rhodes, Alex: *See—*
Kitzner, Ernest W.; and Rhodes, Alex, 3,709,057.

Rhodes, B., & Son, Limited: *See—*
Abbotts, William Edward, 3,709,037.

Rhodes, Barry V.; and Bloxsom, Daniel E., to KMS Industries, Inc., mesne. Apparatus and method for simulating spacecraft erosion. 3,709,026, Cl. 73-12.000.

Rhone-Poulenc S.A.: *See—*
Quentin, Jean-Pierre, 3,709,841.

Rhythm Watch Company, Limited: *See—*
Koide, Hideo, 3,708,972.

Ribich, William A.; Kojabashian, Charles; and Girard, Lauret H., to American Velcro, Inc. Separable fastening device. 3,708,833, Cl. 24-204.000.

Rice, Hal H., to General Motors Corporation. Thermally insulated composite article. 3,709,772, Cl. 161-139.000.

Rich, Alberta Penny. Brassiere. 3,709,230, Cl. 128-486.000.

Rich Manufacturing Company of Oregon, mesne: *See—*
Nations, Robert L., 3,709,527.

Richards, Arthur J. Electronic pressure sensitive switch. 3,710,050, Cl. 200-61.430.

Richards, Hugh W. Plow rake. 3,709,303, Cl. 171-86.000.

Richardson Chemical Company: *See—*
Duchene, Joseph R., 3,709,798.

Richardson, Edwin Allen: *See—*
Suman, George O., Jr.; Murphey, Carey Epps, Jr.; Richardson, Edwin Allen; and Torrest, Robert Steven, 3,709,299.

Richmond, Stanley M. Anterior vaginal retractor for vaginal surgery. 3,709,215, Cl. 128-20.000.

Richterkessing, Frank H. Fluid operated machine and safety control system therefor. 3,709,101, Cl. 91-424.000.

Rickhoff, Leo J., Jr., to Tennessee Jed's Franchise Corporation. Barbecue pit. 3,709,140, Cl. 99-331.000.

Ricoh Co. Ltd.: *See—*
Satomi, Toyokazu, 3,709,602.

Riddle, John B.: *See—*
Roundy, Carlos B.; Riddle, John B.; and Heintz, Ralph M., 3,710,218.

Ridley, John Cecil. Fluid pressure operated rotary actuators. 3,709,105, Cl. 92-137.000.

Riedel, Ekkehard: *See—*
Gaiser, Rainer; Riedel, Ekkehard; and Schmid, Lothar, 3,710,021.

Riehl, Paula: *See—*
Riehl, Wilhelm; and Strobel, Werner Karl, 3,710,093.

Riehl, Wilhelm; deceased (by Riehl, Paula; executrix); and Strobel, Werner Karl, to General Motors Corporation. Device for raising or retracting motor vehicle headlamps. 3,710,093, Cl. 240-7.10h.

Riely, Phyllis, to Pall Corporation. Microporous nonadherent surgical dressing. 3,709,221, Cl. 128-156.000.

Rieter Machine Works, Ltd.: *See—*
Binder, Rolf; Grundler, Christof; and Wildbolz, Rudolf, 3,709,406.

Riken Right Metal Industries Co., Ltd.: *See—*
Takahashi, Toshiro, 3,710,369.

Riley, Brian William: *See—*
Andrews, Brian; Pilkington, James Christopher; and Riley, Brian William, 3,709,358.

Riley, James R.: *See—*
Aurich, Christoph W.; Bryant, John C.; and Riley, James R., 3,709,248.

Rima, Leroy A. Portable antenna mount for trucks. 3,710,339, Cl. 343-715.000.

Rimar Manufacturing Inc.: *See—*
Herr, Robert L., 3,708,939.

Rimmer, Michael J.: *See—*
Hanes, James W. E.; Rimmer, Michael J.; Weber, Ronald A.; and Hintzen, Walter J., 3,709,291.

Rimmler, Fred F., to Stanley Works, The. Convergence cup with one-piece shield. 3,710,164, Cl. 313-77.000.

Rin, Ensei: *See—*
Sawada, Hideo; Rin, Ensei; Yamada, Isao; Mano, Hiroshi; and McGourty, Thomas K., 3,710,359.

Ripley, Ian Stanley: *See—*
Hepworth, Paul; Ripley, Ian Stanley; and Scott, Norman, 3,709,854.

Ritchie, Colin Foster: *See—*
Edgar, Owen Burchell; Hughes, William; Lawrence, Derek R.; Lederer, Gerald; and Ritchie, Colin Foster, 3,709,710.

Ritter, Ronald E.: *See—*
Hutson, Thomas, Jr.; and Ritter, Ronald E., 3,709,951.

Ritzen, Johannes Maria Jozef; and Peloschek, Hans Peter, to U.S. Philips Corporation. Method of manufacturing magnet cores and magnet cores manufactured by the same. 3,709,822, Cl. 252-62.600.

Rival Manufacturing Company: *See—*
Dupuis, Maurice V.; and Greer, John R., 3,710,159.

Rivat-Lahousse, Andre, to Saint-Gobain. Apparatus for the production of shaped articles of expanded cohered granules of thermoplastic material, in particular polystyrene. 3,709,651, Cl. 425-4.000.

Roberto, Francisco Q., to United States of America, Air Force. Ionic interhalogen oxidizing agent and method. 3,709,748, Cl. 149-109.000.

Robertshaw Controls Company: *See—*
Kenyon, Fred V., 3,709,740.
McIntosh, Harold A., 3,709,460.

Robertshaw Controls ompany: *See—*
Bauer, Werner R., 3,710,343.

Robertson, Jack R. Gas obturating method. 3,709,214, Cl. 128-4.000.

Robertson, John A., to Mead Corporation, The. Method and apparatus for aerodynamic switching. 3,709,432, Cl. 239-4.000.

Robinson, Dale D., to Beckman Instruments, Inc. Manually operated sample changing elevator and light sealing mechanism for scintillation counters and the like. 3,710,120, Cl. 250-106.0sc.

Robinson, James G. Aerial sign. 3,708,900, Cl. 40-212.000.

Rochelmeyer, Hans: *See—*
Eich, Eckart; and Rochelmeyer, Hans, 3,709,891.

Rochester Envelope Company: *See—*
Taylor, Gerald A., 3,709,753.

Rochester Silo Co.: *See—*
Price, Raymond R., 3,709,345.

Rock, Wilfried: *See—*
Hubert, Helmut; Jung, Anton L.; Lapczyna, Manfred; Ledwon, Erhard; Rock, Wilfried; and Schmidt-Burbach, Gerhard, 3,710,077.

Roelf de Muinck, Andre: *See—*
Hite, Edward Lee; Ramge, Dennis Lee; and Roelf de Muinck, Andre, 3,709,327.

Rogers, Cedric G., to Avco Corporation. Method of trimming crystalline photosensor arrays to close tolerances. 3,708,936, Cl. 51-310.000.

Rogers, William L. Motor driven pipe wrench. 3,709,072, Cl. 81-57.130.

Rohm & Haas Company: *See—*
McNulty, Patrick J.; Swithenbank, Colin; Viste, Kenneth L.; and von Meyer, William C., 3,709,897.

Rohm & Haas G.m.b.H.: *See—*
Gruber, Wilhelm; Kleine-Doepke, Wolfgang; Quis, Peter; and Schroeder, Guenther, 3,709,934.

Rohr Industries, Inc.: *See—*
Tantlinger, Keith W., 3,708,938.

Roland, George W.: *See—*
Hopkins, Richard H.; Roland, George W.; Partlow, William D.; and Steinbruegge, Kenneth B., 3,710,278.

Rolin, Kenneth C., Sr.: *See—*
Leopoldi, Norbert; and Rolin, Kenneth C., Sr., 3,709,238.

Rolling Mill Engineers, Inc.: *See—*
Peterson, Edward C.; and Davis, Ernest E., 3,709,346.

Rolls-Royce Limited: *See—*
Pollitt, James, 3,709,033.

Rondo Building Services Pty., Limited: *See—*
Cuckson, Eric Engel, 3,708,941.

Rooks, John C., to Schjeldahl, G. T., Company. Sequentially addressable display apparatus with means for reversing direction of transfer. 3,710,180, Cl. 315-153.000.

Root-Lowell Manufacturing Co.: *See—*
Collins, Dean E., 3,709,409.

Rooy, Henricus Johannes Van: *See—*
Pax, Wilhelmus Petrus Johannes Franciscus; and Rooy, Henricus Johannes Van, 3,710,289.

Roper, Ralph E., to Wallace Expanding Machines, Inc. Single sheet pallet. 3,709,162, Cl. 108-51.000.

Rosen, Karl Isac Joel. Disc-type brake for thread. 3,709,332, Cl. 188-71.100.

Rosenberg, David, to Pall Corporation. Timer. 3,709,636, Cl. 417-12.000.
Rosov, Robert J., to Oregon Research Insitute. Spoken questionnaire method and apparatus. 3,708,891, Cl. 35-9.00a.
Rospatch Corporation: *See—*
Templeton, John Glenn; and Seitz, Calvin W., 3,709,402.
Ross, Sheila W. Smoke flavoring barbecue additive and method of making. 3,709,700, Cl. 44-6.000.
Rossman, Joseph; deceased (Provident National Bank; executor), to Packo, Joseph J. Process of sealing leaks. 3,709,712, Cl. 117-2.00r.
Roth, Arden J.: *See—*
Roth, Verlon C.; and Roth, Arden J., 3,709,247.
Roth, Verlon C.; and Roth, Arden J. Multi-purpose piston valve. 3,709,247, Cl. 137-271.000.
Rothermel, Heinz. Hinge iron for posture chair. 3,709,535, Cl. 287-306.000.
Rotsen, Karl Arturovich: *See—*
Abramov, Viktor Petrovich; Junga, Yan Petrovich; Berzin, Gunard Valdemarovich; Skrupsky, Voldemar Petrovich; Frolov, Petr Nikolaevich; Lugovskoi, Andrei Lukyanovich; Shilgorin, Felix Alexandrovich; Dalbinsh, Yan Yanovich; Rotsen, Karl Arturovich; Ziemelis,Andris Eduardovich; Elksnis, Artur Yanovich; and Priede, Bruno Andreevich, 3,709,270.
Roulet, Jean; and Cimadevilla, Armand, to Sea Tank Co. Immersible reservoir. 3,708,986, Cl. 61-46.000.
Roulet, Jean; and Cimadevilla, Armand. Concrete reservoir for underwater use. 3,708,987, Cl. 61-46.000.
Roundy, Carlos B.; Riddle, John B.; and Heintz, Ralph M., to Micro-Magnetic Industries, Inc. Induction motor speed control. 3,710,218, Cl. 318-231.000.
Rouse, Russell V.: *See—*
Looker, Olin L.; Zemke, Frederick A.; Knicely, David R.; Rouse, Russell V.; and Slates, Larry L., 3,709,231.
Rowan, Clement W.: *See—*
Bray, Ralph; and Rowan, Clement W., 3,710,143.
Rowland, Carroll W.: *See—*
Burcher, Ernest E.; Rowland, Carroll W.; and Sinclair, Archibald R., 3,710,122.
Rowland, David L. Furniture for seating people. 3,709,559, Cl. 297-445.000.
Rowley, David S.; and Ward, Charles E., to Christensen Diamond Products Company. Diamond drill bits. 3,709,308, Cl. 175-329.000.
Royal Oak Charcoal Company: *See—*
Trepanier, Maurice A., 3,708,888.
Rozmanith, Jolan S.: *See—*
Bercz, Christa V.; Rozmanith, Jolan S.; and Bercz, Jeno P., 3,708,903.
Rubenstein, David A., to International Business Machines Corporation. Machine recognition of lexical symbols. 3,710,321, Cl. 340-146.30d.
Rubin, Robert M.: *See—*
Enters, Edward W.; Detjen, Edgar W.; and Rubin, Robert M., 3,708,968.
Rubio, Manuel J., to Barrera, Roberto Gonzalez. Tortilla and process using hydrophilic inorganic gels. 3,709,696, Cl. 99-80.00r.
Ruckstuhl, Franz, to Olsson, Erik, A.G. Method and apparatus for guiding a continuous casting strand. 3,709,285, Cl. 164-282.000.
Rudiak, Boris Ivanovich: *See—*
Bomko, Vasily Alexeevich; Revutsky, Evgeny Ivanovich; Rudiak, Boris Ivanovich; and Pipa, Anatoly Vasilievich, 3,710,163.
Rudkin, George O., Jr.: *See—*
Feltzin, Joseph; Kuehn, Erich; and Rudkin, George O., Jr., 3,709,684.
Rundell, James R., to Cyprus Mines Corporation. Wire and cable printer. 3,709,143, Cl. 101-37.000.
Rush, Jerome. Portable strip cutter. 3,709,081, Cl. 83-411.000.
Russell, Alan F.: *See—*
Moffatt, John G.; and Russell, Alan F., 3,709,874.
Rutherford, Frank; Arenson, Ivor Gerald; Cracknell, Alan George; Foulds, William Henry; and Derrick, Albert, to Arenson, A., Limited. Desks. 3,709,577, Cl. 312-263.000.
Rutherford, Henry Ames: *See—*
Walsh, William Kershaw; and Rutherford, Henry Ames, 3,709,658.
Ryden, James W., to Advanced Management Engineering & Research Co. Hitch bar stabilizer. 3,709,523, Cl. 280-502.000.
Ryley, Derek Vernon; and Claydon, Gyongyver, to Marconi Company Limited, The. Television camera automatic beam alignment. 3,710,018, Cl. 178-7.200.
Saab-Scania Aktiebolag: *See—*
Jonason, Arne Holger; and Granlund, Gosta Holger, 3,709,565.
Sach, George Sidney: *See—*
Bowden, Kenneth; Davis, Robin Alastair; Hills, Derek William; and Sach, George Sidney, 3,709,925.
Sada, Tomohiko; Tsuchiya, Noriyuki; Amamiya, Tameo; Kaneda, Yoko; and Ohta, Kazuyuki, to Sony Corporation. Printed circuit board having a thermally insulated resistor. 3,710,195, Cl. 317-101.00c.
Safeway Stores, Incorporated: *See—*
Wilcox, Burdsal G., 3,708,949.
Safronova, Ljudmila Andreevna: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.
Saiga, Riki. Decoration. 3,709,767, Cl. 161-14.000.
Saint-Gobain: *See—*
Rivat-Lahousse, Andre, 3,709,651.
Saito, Ahozi: *See—*
Minami, Satoyuki; Shinke, Yoshiaki; Saito, Ahozi; and Osakada, Atsushi, 3,709,806.
Saito, Nobuo: *See—*
Okuhara, Akira; Nakajima, Takashi; and Saito, Nobuo, 3,709,802.
Sakai, Masaomi: *See—*
Matsumoto, Yushi; Ozawa, Tunahiro; Ochiai, Tadashi; and Sakai, Masaomi, 3,709,593.
Sakai, Yoshio; Nakamura, Zenkichi; and Takahashi, Katsumasa, to Sony Corporation. Magnetic head with tape contacting guard surfac and pole tips of similar ferrite materials. 3,710,038, Cl. 179-100.20c.
Sakaibara, Yasumasa: *See—*
Kunichika, Sango; Sakaibara, Yasumasa; Kyotofu, Noguchi; Akio, Kurisaki; Konomu, Kato; and Uchiyama, Mitsuru, 3,709,927.
Salutati, Giovanni. Time centering apparatus for railroad installations and other uses. 3,710,132, Cl. 307-43.000.
Samejima, Hirotoshi; Furuya, Akira; Shimaoka, Keiji; and Aoki, Yoshiatsu, to Kyowa Hakko Kogyo Kabushiki Kaisha. Production of mixed crystals of sodium glutamate and sodium inosinate. 3,709,701, Cl. 99-140.00n.
Samph, William J.: *See—*
Chesterton, Stanley Keith, Jr.; and Samph, William J., 3,710,250.
Sampson, Keith George: *See—*
Lee, Stephen Arthur; Cardy, Charles Frederick; and Sampson, Keith George, 3,709,981.
Samsel, Richard W.: *See—*
Degnan, William J.; and Samsel, Richard W., 3,709,608.
Sandoz Ltd.; a/k/a Sandoz AG: *See—*
Ebner, Cuno; and Schuler, Max, 3,709,885.
Lutz, Karl; and Schuler, Max, 3,709,960.
Sandoz-Wander, Inc.: *See—*
Cooke, George A.; and Houlihan, William J., 3,709,887.
Galantay, Eugene E., 3,709,878.
Hardtmann, Goetz E., 3,709,888.
Houlihan, William J., 3,709,677.
Houlihan, William J., 3,709,938.
Sanford, Jack C. Adjustable wig form. 3,709,407, Cl. 223-66.000.
Sankyo Company Limited: *See—*
Yoshida, Norio; Tomita, Kuniyuki; and Iizuka, Yoshio, 3,709,906.
Sanner, Axel: *See—*
Krauch, Carl Heinrich; and Sanner, Axel, 3,709,805.
Sansone, Ronald P., to Watson Leavenworth Kelton & Taggart, mesne. Information recording method and system. 3,709,117, Cl. 95-4.50r.
Santarossa, Mario C.: *See—*
Hilyard, Byron L.; and Santarossa, Mario C., 3,709,216.
Santerre, Gerard H. Tool holder for automatic screw machine. 3,709,074, Cl. 82-36.00r.
Santos, Manuel V. Decorative garment accessory. 3,708,804, Cl. 2-244.000.
Santos, Manuel V. Surgical needle holder. 3,709,226, Cl. 128-340.000.
Sanyo Electric Co., Ltd.: *See—*
Deguchi, Yutaka; Kashihara, Hideo; Koozuki, Rikuzo; Takahashi, Kazuyoshi; and Ikeda, Mitsuyuki, 3,708,962.
Ikeda, Hironosuke; and Kondo, Tetsuya, 3,710,201.
Sarem, Amir M., to Union Oil Company of California. Apparatus for preparing and extruding a gelatinous material. 3,709,641, Cl. 425-7.000.
Sargent Industries, Inc., mesne: *See—*
Chacko, Joseph, 3,709,044.
Sarns, Inc.: *See—*
De Vries, James H., 3,709,222.
Sasaki, Hiromu: *See—*
Matsuo, Yoshihiro; Sasaki, Hiromu; and Hayakawa, Shigeru, 3,709,704.
Sasaki, Jiro. Method for preparation of a filter medium. 3,708,858, Cl. 29-419.000.
Sato, Hisaya: *See—*
Mori, Kan; Imaizumi, Fumitake; Sato, Hisaya; Nagaoka, Isao; Hirayanagi, Shigetoshi; Shibata, Toru; and Kawatani, Shigeo, 3,709,851.
Sato, Junzi; and Tanabe, Takako, to Fujitsu Limited. Method of etching insulating films. 3,709,749, Cl. 156-11.000.
Satomi, Toyokazu, to Ricoh Co. Ltd. Optical path length compensation in a copier. 3,709,602, Cl. 355-49.000.
Satomo, Kouji: *See—*
Takikawa, Toshio; Satomo, Kouji; and Kodama, Takashi, 3,709,777.
Saunders, Alex Michael, to United States of America, Health, Education, and Welfare. Specific ion electrode for sulfate. 3,709,811, Cl. 204-195.00m.
Savage, Dana C., Jr. Parliamentary procedure guide. 3,708,894, Cl. 35-21.000.

Savage, Elton Stuart, to Dravo Corporation. Method and apparatus for denitrification of treated sewage. 3,709,364, Cl. 210-195.000.
Savage, Sidney Clifford: *See—*
Widdowson, Albert Henry; and Savage, Sidney Clifford, 3,709,003.
Savin Business Machines Corporation: *See—*
Hastwell, Peter J., 3,709,594.
Sawada, Hideo; Rin, Ensei; Yamada, Isao; Mano, Hiroshi; and McGourty, Thomas K., to Kabushiki Kaisha Ricoh. Work sampler for magnetically recording information in time-coordinated bits. 3,710,359, Cl. 340-174.10g.
Sawagata, Shinichi: *See—*
Tsuneta, Asahide; and Sawagata, Shinichi, 3,710,165.
Sawatari, Kenichi: *See—*
Goya, Yoshihito; Nakanishi, Michio; Sawatari, Kenichi; Hirose, Akira; and Shinozawa, Tetsuichi, 3,709,674.
Sawyer, Roderick V., to CTS Corporation. Stranded conductor and method of making same. 3,710,008, Cl. 174-131.00a.
Saxberger, Adolf: *See—*
Pfannkuch, Heinrich; Saxberger, Adolf; and Schnebel, Fritz, 3,709,583.
Sayce, Leonard Alfred; and Jespersen, Knut Indergaard, to National Research Development Corporation. Optical measuring apparatus comprising oscillator and phase comparator. 3,710,124, Cl. 250-206.000.
Scales, John Tracey; and Goddar, David, to National Research Development Corporation. Prosthetic elbow joint. 3,708,805, Cl. 3-1.000.
Scambi, Attilio F., Jr., to Radiation Incorporated. Gregorian antenna with ring focus. 3,710,341, Cl. 343-779.000.
Scan-Data Corporation: *See—*
Frank, Alan I., 3,709,525.
Scanamation Corporation: *See—*
Miller, Robert Pincus; Badian, Abraham; and Dickstein, Samuel P., 3,710,319.
Schabel, Joachim; and Liebegott, Hans-Peter, to DS-Chemie GmbH & Co. KG. Process of producing textile goods coated with foamed polyvinyl chloride. 3,709,725, Cl. 117-161.0uf.
Schad, Anthony G.: *See—*
Zammit, Frank X.; and Schad, Anthony G., 3,710,194.
Schaefer, Gerd: *See—*
Von Gottberg, Horst; Schaefer, Gerd; and Joerns, Guenter, 3,709,190.
Schaefer, Robert H.; and Williams, Richard H., to General Motors Corporation. Multi-ratio transmission and control with downshift inhibitors. 3,709,064, Cl. 74-752.00a.
Schamberg, Eckehard; and Hoigne, Juerg, to Inrescor A.G. Graft polymerization products and processes. 3,709,718, Cl. 117-93.310.
Scheidweiler, Andreas: *See—*
Lampart, Thomas; Scheidweiler, Andreas; and Kuhn, Max, 3,710,110.
Scherenberg, Hans O., to Daimler-Benz Aktiengesellschaft. Stop-light for motor vehicles. 3,710,315, Cl. 340-62.000.
Scherer, Carl A.; and Beatenbough, Paul K., to General Motors Corporation. Automatic expansion valve, in line, non-piloted. 3,708,998, Cl. 62-210.000.
Schief, Alfred: *See—*
Tischner, Horst; Schief, Alfred; and Baur, Hugo, 3,710,332.
Schilling, Rainer, to Bosch, Robert, G.m.b.H. Convertible power tool. 3,710,154, Cl. 310-50.000.
Schindelbeck, Werner: *See—*
Johswich, Friedrich; and Schindelbeck, Werner, 3,708,981.
Schipper, Richard A.: *See—*
Brewer, Donald R.; and Schipper, Richard A., 3,710,085.
Schjeldahl, G. T., Company: *See—*
Rooks, John C., 3,710,180.
Schlaikjer, Carl R.: *See—*
Liang, Charles C.; and Schlaikjer, Carl R., 3,709,734.
Schlesinger, Kurt, to General Electric Company. Electron-optical recording device. 3,710,176, Cl. 315-31.00r.
Schlinger, Warren G.: *See—*
Marion, Charles P.; Schlinger, Warren G.; and Slater, William L., 3,709,669.
Schlumberger Technology Corporation: *See—*
Davis, Billy W., 3,710,006.
Schmid, Lothar: *See—*
Gaiser, Rainer; Riedel, Ekkehard; and Schmid, Lothar, 3,710,021.
Schmidgall, William M., to Technological Products, Inc. Surface heating device. 3,709,208, Cl. 126-271.20a.
Schmidt, William G. Means for determining unbalance in rotary workpieces. 3,709,043, Cl. 73-466.000.
Schmidt-Burbach, Gerhard: *See—*
Hubert, Helmut; Jung, Anton L.; Lapczyna, Manfred; Ledwon, Erhard; Rock, Wilfried; and Schmidt-Burbach, Gerhard, 3,710,077.
Schnebel, Fritz: *See—*
Pfannkuch, Heinrich; Saxberger, Adolf; and Schnebel, Fritz, 3,709,583.
Schneider, Jos., & Co.: *See—*
Hess, Karl Gunter; and Werner, Kurt, 3,709,133.
Schneyer, Herbert D. Composition and method for treatment of ossilets and pathological calcification in animals. 3,709,989, Cl. 424-232.000.
Schon, Konrad: *See—*
Huszar, Josef; and Schon, Konrad, 3,709,097.
Schopper, Erwin: *See—*
Haase, Gunter; and Schopper, Erwin, 3,709,692.
Schor, Ferdinand William; and Fritz, William Baird, to AMP Incorporated. Filter pin connector having low ground return impedance. 3,710,285, Cl. 333-79.000.
Schrader, Gerhard; and Homeyer, Bernhard, to Farbenfabriken Bayer Aktiengesellschaft. N-isopropyl-O-ethyl-O-arylphosphoric acid ester amides. 3,709,961, Cl. 260-949.000.
Schrader, Gerhard; and Hammann, Ingeborg, to Farbenfabriken Bayer Aktiengesellschaft. β-phenylethyl esters of 0-alkyl-0-phenylthionothiolphosphoric acids. 3,709,962, Cl. 260-949.000.
Schroder, Johann, to U.S. Philips Corporation. Heat accumulator. 3,709,209, Cl. 126-400.000.
Schroeder, Guenther: *See—*
Gruber, Wilhelm; Kleine-Doepke, Wolfgang; Quis, Peter; and Schroeder, Guenther, 3,709,934.
Schroeter, Siegfried H., to General Electric Company. Method of preparing 3-hydroxy aldehydes and ketones. 3,709,944, Cl. 260-598.000.
Schubert, Rolf: *See—*
Grossman, Gunter; Moder, Hans-Ulrich; and Schubert, Rolf, 3,710,029.
Schubler, Karl-Heinz: *See—*
Baumer, Albrecht; and Schubler, Karl-Heinz, 3,709,477.
Schuler, Max: *See—*
Ebner, Cuno; and Schuler, Max, 3,709,885.
Lutz, Karl; and Schuler, Max, 3,709,960.
Schultea, Wesley J. Gun cleaning and protecting device. 3,708,820, Cl. 15-104.160.
Schulz, Gerhard: *See—*
Goetze, Walter; Kasper, Werner; Klatt, Gerhard; and Schulz, Gerhard, 3,709,945.
Schulz, Horst, to Fichtel & Sachs A.G. One way clutch driven by oscillating drum. 3,709,341, Cl. 192-64.000.
Schulze, Erwin F. C.; and Baker, Robert G., to Addressograph Multigraph Corporation. Paper collator and distributor. 3,709,480, Cl. 270-58.000.
Schulze, James R.; and Soroka, Joe F., to Rexham Corporation, mesne. Packaging machine with splitter bar fill. 3,708,952, Cl. 53-112.00b.
Schumacher, Cecil W., to Borg-Warner Limited. Motor vehicle plunger type switch unit with self-adjusting shaft coupling connection. 3,710,048, Cl. 200-52.00r.
Schutte, Rolf: *See—*
Becker, Erwin; and Schutte, Rolf, 3,708,964.
Schwalm, Glendon Henry: *See—*
Mann, Richard Charles, Sr.; and Schwalm, Glendon Henry, 3,708,878.
Schwartz, Gary R.: *See—*
McGough, Gregory J., 3,709,312.
Schwartzstein, Frederick, to Blackstone Industries, Inc. Cooking instrument. 3,709,141, Cl. 99-343.000.
Schwedland, Ronald P.: *See—*
Emmerson, Calvin W.; and Schwedland, Ronald P., 3,709,632.
Schwind, Richard G., to Nielsen Engineering and Research Corporation. Fluid turbulence study apparatus and method. 3,709,036, Cl. 73-147.000.
SCM Corporation: *See—*
Soule, Winsor, Jr.; and Efstathioun, John, 3,710,325.
Scott & Fetzer Comapny, The: *See—*
Edwards, James D.; and McQuinn, Max R., 3,710,042.
Scott and White Memorial Hospital: *See—*
Hayward, Ronald Hamilton, 3,709,227.
Scott, Benton boyd: *See—*
Cross, Donald John; Eckenbrecht, Robert Roy; Price, Arthur Burke; and Scott, Benton boyd, 3,710,012.
Scott, Norman: *See—*
Hepworth, Paul; Ripley, Ian Stanley; and Scott, Norman, 3,709,854.
Scott Paper Company: *See—*
Buhayar, Eric S.; Hazard, James E.; Jaagus, John J.; Werner, Fred W.; Wheeler, Robert W.; and Crowe, Robert C., 3,709,349.
Faessinger, Robert W., 3,709,857.
Scott, Sherwood and Brindley Foundation: *See—*
Hayward, Ronald Hamilton, 3,709,227.
Scrutton, Simon Lindsay: *See—*
Hercock, Robert James; and Scrutton, Simon Lindsay, 3,709,685.
Sea Tank Co.: *See—*
Roulet, Jean; and Cimadevilla, Armand, 3,708,986.
Seager, Leslie C.: *See—*
Stephan, Hallis N.; and Seager, Leslie C., 3,709,623.
Seals, Dowty, Limited: *See—*
Underwood, Cyril James, 3,709,507.
Sealy, Inc.: *See—*
Basner, Ernest L., 3,708,809.
Searle, G. D., & Co.: *See—*
Cusic, John W.; and Coyne, William E., 3,709,947.
Krimmel, Carl Peter, 3,709,937.
SEBEC, Societe d'Exploitation de Brevets d'Emballage Cosmetique S.A.: *See—*
Gruska, Georges, 3,709,618.
Seeburg Corporation of Delaware, The: *See—*
Jachimek, Thomas P., 3,710,320.
Seerahn, Robert. Hair styling template. 3,709,234, Cl. 132-45.00r.
Seetaram, Roy. Captive fastening element. 3,709,089, Cl. 85-77.000.

Segal, Zvi, to International Business Machines Corporation. Aligning and orienting apparatus. 3,709,378, Cl. 214-1.00q.

Sehnal, Jan: *See—*
Zaruba, Wenzel; and Sehnal, Jan, 3,709,047.

Seibert, Franklin J., to Ja-Dor Inc. Neckwear support structure. 3,708,802, Cl. 2-155.000.

Seibu Gomu Kagaku Kabushiki Kaisha: *See—*
Miura, Misao, 3,708,988.

Seidewand, Edward H., to General Motors Corporation. Cylinder lock. 3,709,006, Cl. 70-364.00r.

Seifert, Gerald R.: *See—*
Slagley, William E.; Seifert, Gerald R.; and Valonis, Edmund J., 3,710,084.

Seike, Helmut K., to Eltra Corporation. Multiple output generator with multiple voltage regulators. 3,710,226, Cl. 320-15.000.

Seinecke, Siegfried, to Siemens Aktiengesellschaft. Arrangement for the decrease of reflection interferences within networks for pulse. 3,710,282, Cl. 333-8.000.

Seitz, Calvin W.: *See—*
Templeton, John Glenn; and Seitz, Calvin W., 3,709,402.

Seitz, Lamont J.; and Hauser, Stephen G., to Baxter Laboratories, Inc. Latch for receptacle. 3,709,538, Cl. 292-128.000.

Sekigawa, Tsuneo: *See—*
Kodama, Hisashi; Sekigawa, Tsuneo; Hata, Kazumi; and Nakaya, Akimichi, 3,708,989.

Selas Corporation of America: *See—*
Morck, Charles W., Jr., 3,709,239.

Selin, Clifford E.: *See—*
Proell, Wayne A.; Selin, Clifford E.; Holbrook, Stanford T.; and Hammond, Francis H., 3,709,931.

Sellari, Daniele, Jr., to International Telephone and Telegraph Corporation. Multi frequency receiver. 3,710,031, Cl. 179-84.0vf.

Selman, Gordon Leslie; and Darling, Alan Sidney, to Johnson, Matthey & Co., Limited. Dispersion strengthening of platinum group metals and alloys. 3,709,667, Cl. 29-182.500.

Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H.: *See—*
Vladik, Liboslav, 3,708,851.

Sendzimir, Tadeusz. Beam backed cluster mill. 3,709,019, Cl. 72-242.000.

Sentralinstitutt for Industriell forskning: *See—*
Bergem, Norman; Blindheim, Ulf; Onsager, Olav-Torgeir; and Wang, Hagbarth, 3,709,953.

Sergant, Gwendolen Alice: *See—*
Howard, John Arthur; and Sergant, Gwendolen Alice, 3,709,160.

Servi, Italo S.: *See—*
Corrigan, Donald A.; Servi, Italo S.; and Wang, Chih-Chung, 3,709,722.

Service d'Exploitation Industrielle des Tabacs et des Allumettes: *See—*
Flesselles, Jacques; and Poupin, Raymond, 3,709,350.

Severs, John W., to Aluminum Company of America. Lubricating tongs. 3,709,549, Cl. 294-118.000.

Shafer, Homer J. Piston operator for imparting rotary motion. 3,709,106, Cl. 92-138.000.

Shannon, Bill M.; and Weimer, Charles L., to Westinghouse Electric Corporation. Bus duct with hinged cover for plug-in region. 3,710,302, Cl. 339-22.00b.

Shapiro, Eugene B.: *See—*
Gore, William C.; and Shapiro, Eugene B., 3,709,256.

Shapland, James Thomas, to United States Steel Corporation. Sliding gate closure assembly for bottom-pour teeming vessels. 3,709,411, Cl. 222-512.000.

Sharp, Denis, to U.S. Philips Corporation. Signal processing circuit. 3,710,186, Cl. 317-5.000.

Sharp, William T., to General Electric Company. Jackscrew type of racking mechanism for a movable switchgear unit. 3,710,044, Cl. 200-50.0aa.

Shattes, Walter J.; and Marancik, william G., to Air Reduction Company, Incorporated. Hybrid superconducting material. 3,710,000, Cl. 174-15.00c.

Shaw, Reginald O.: *See—*
Farrell, George J.; Lyon, Walter R.; Mills, Loring K.; and Shaw, Reginald O., 3,709,132.

Shea, Gerald J.; and Marach, David R., to Underwriters Safety Device Co. Multi-lamp assembly. 3,710,090, Cl. 240-2.00r.

Sheedy, Patrick T.: *See—*
Koenig, Martin F.; De Backer, Frank A.; and Issa, Manuel, 3,710,300.

Sheets, Kerney T. Projectable lawn sprinkler. 3,709,435, Cl. 239-206.000.

Sheetz, Charles E., to FMC Corporation. Conveyor diverter mechanism. 3,709,353, Cl. 198-28.000.

Shelef, Ginton, to Shell Oil Company. Method of improving a process with many variables. 3,710,347, Cl. 444-1.000.

Shell Oil Company: *See—*
Anderson, William S., 3,709,861.
Boyce, Clive B. C.; Barker, Michael D.; and Wood, Jack, 3,709,902.
Coles, Roy D., Jr.; Thomeer, Johannes H. M.; and Chase, Curtis A., Jr., 3,709,032.
Magoon, Eugene F., 3,709,919.
Pramann, James A., 3,709,298.
Shelef, Ginton, 3,710,347.
Suman, George O., Jr.; Murphey, Carey Epps, Jr.; Richardson, Edwin Allen; and Torrest, Robert Steven, 3,709,299.

Shellag Estates Limited: *See—*
Broadbent, Edward Gerald, 3,709,552.

Shellhause, Ronald L., to General Motors Corporation. Metering valve assembly for combination valve. 3,709,563, Cl. 303-6.00c.

Sherwood, Henry A., to Lorraine Industries, Inc. Phonograph apparatus. 3,709,504, Cl. 274-10.00s.

Sherwood, William T.: *See—*
Balliett, John W.; and Sherwood, William T., 3,710,010.

Shevyakov, Nikolai Nikolaevich: *See—*
Belkovsky, Viktor Alexandrovich; Grzhimalsky, Leopold Leopoldovich; Ilievsky, Irma Irmovich; Lotsmanov, Sergei Nikolaevich; Petrunin, Ivan Egorovich; Sukhov, Anatoly Vasilievich; Tikhonov, Boris Sergeevich; Levin, Boris Isaakovich; Moroz, Pavel Kirillovich Strekalov, Genrikh Nikolaevich; Chernov, Andrei Nikolaevich; Chizhov, Sergei Ilich; and Shevyakov, Nikolai Nikolaevich, 3,709,682.

Shibata, Toru: *See—*
Mori, Kan; Imaizumi, Fumitake; Sato, Hisaya; Nagaoka, Isao; Hirayanagi, Shigetoshi; Shibata, Toru; and Kawatani, Shigeo, 3,709,851.

Shigeru Kakubari: *See—*
Tanaka, Tetsuro; and Bansho, Kiyoshi, 3,710,275.

Shikasho, Satoru: *See—*
Channell, Andrew Willis; Shikasho, Satoru; and Sommer, Gilbert Robert, 3,709,431.

Shilgorin, Felix Alexandrovich: *See—*
Abramov, Viktor Petrovich; Junga, Yan Petrovich; Berzin, Gunard Valdemarovich; Skrupsky, Voldemar Petrovich; Frolov, Petr Nikolaevich; Lugovskoi, Andrei Lukyanovich; Shilgorin, Felix Alexandrovich; Dalbinsh, Yan Yanovich; Rotsen, Karl Arturovich; Ziemelis,Andris Eduardovich; Elksnis, Artur Yanovich; and Priede, Bruno Andreevich, 3,709,270.

Shimaoka, Keiji: *See—*
Samejima, Hirotoshi; Furuya, Akira; Shimaoka, Keiji; and Aoki, Yoshiatsu, 3,709,701.

Shimizu, Toshiharu: *See—*
Kato, Jinichi; and Shimizu, Toshiharu, 3,709,606.

Shimoda, Keitaro; Tsutsui, Nobuhiro; Zoda, Keiichi; and Ueki, Masayuki, to Japan Exlan Company, Limited. Method and apparatus for producing multilaminated fibers. 3,709,971, Cl. 264-182.000.

Shinke, Yoshiaki: *See—*
Minami, Satoyuki; Shinke, Yoshiaki; Saito, Ahozi; and Osakada, Atsushi, 3,709,806.

Shinozawa, Tetsuichi: *See—*
Goya, Yoshihito; Nakanishi, Michio; Sawatari, Kenichi; Hirose, Akira; and Shinozawa, Tetsuichi, 3,709,674.

Shionogi & Co., Ltd.: *See—*
Kondo, Eiji; Mitsugi, Takashi; and Tori, Kazuo, 3,709,789.

Shiozaki, Hiroyuki; and Takahashi, Norio, to Ishikawojima-Harima Jukogyo Kabushiki Kaisha. Method for detecting eccentricity and phase angle of working or backing roll in rolling mill. 3,709,009, Cl. 72-8.000.

Shirlpool Corporation: *See—*
Clearman, Jack F.; Ohlsson, Leonard W.; and Mackin, Michael H., 3,708,992.

Shlepakov, Valery Nikolaevich: *See—*
Pokhodnya, Igor Konstantinovich; Shlepakov, Valery Nikolaevich; and Alter, Vladimir Fedorovich, 3,710,073.

Shoupp, William E.; and Bratkowski, Walter V., to Westinghouse Electric Corporation. Integral mechanically-actuated electrical power source for a photographic camera or a flashgun accessory. 3,709,118, Cl. 95-11.50r.

Shrader, Robert L.; and Tsujimoto, Kazumi N., to Airco, Inc. Vapor source assembly. 3,710,072, Cl. 219-121.0eb.

Shull, John D.: *See—*
Kossuth, Donald A.; and Shull, John D., 3,708,935.

Shur-Line Manufacturing Co., Inc.: *See—*
Chase, David O.; Maloney, Martin V.; Wood, Frederick J., Jr.; and Wood, Barry B., 3,708,821.

Siddall, John B., to Zoecon Corporation. Methylenedioxyphenyl compounds. 3,709,914, Cl. 260-340.500.

Siddall, John B., to Zoecon Corporation. Sesamalyl and piperonyl ethers and thioethers. 3,709,915, Cl. 260-340.500.

Siddall, Keith: *See—*
Hibbert, Charles; Kirk, Frederick, Arthur; Siddall, Keith; and Howard, Michael Roi, 3,709,628.

Sidorenko, Mikhail Nikolaevich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.

Siegel, Vernon H. Calculation of approximate magnitude of a physical vector. 3,710,087, Cl. 235-189.000.

Siegele, John Charles: *See—*
Gordon, Robert Louis; and Siegele, John Charles, 3,709,325.

Siemens Aktiengesellschaft: *See—*
Blaschke, Felix; and Haken, Klaus, 3,710,088.
Flachsbarth, Dieter, 3,710,360.

Friedel, Rudolf, 3,710,170.
Gaiser, Rainer; Riedel, Ekkehard; and Schmid, Lothar, 3,710,021.
Grossman, Gunter; Moder, Hans-Ulrich; and Schubert, Rolf, 3,710,029.
Hotz, Karl, 3,708,818.
Kessler, Claus; and Kohler, Werner, 3,710,247.
Kuehnemann, Karl; and Turban, Josef, 3,710,240.
Peche, Gerhard, 3,710,191.
Seinecke, Siegfried, 3,710,282.

Siepmann, Hans: *See—*
Wieting, Eugen; and Siepmann, Hans, 3,709,011.

Sieren, Gerald E., to Allis-Chalmers Corporation. Clutch and brake pedal with neutral safety switch. 3,709,344, Cl. 192-.094.

Sierracin Corporation, The: *See—*
Anderson, Quinn S.; Levin, Berton P.; and Thomson, Jackie D., 3,709,192.

Sigg, Hans, to Maag Gear Wheel & Machine Company, Limited. Clutch with teeth alignment cam. 3,709,343, Cl. 192-67.00r.

Signetics Corporation: *See—*
Drees, Joseph M., 3,709,424.

Silverman, Benjamin D.: *See—*
Jacobs, John T.; Keester, Kenneth L.; and Silverman, Benjamin D., 3,710,353.

Simon, Hurst; and Birkenmaier, Wilhelm, to Eastman Kodak Company. Shutter control apparatus. 3,709,135, Cl. 95-60.000.

Simon, Marvin K.: *See—*
National Aeronautics and Space Administration, 3,710,261.

Simonson, Alden D.: *See—*
Watts, John F.; Lang, John M.; Simonson, Alden D.; and Nomura, Raymond S., 3,709,450.

Simonson, Harris; Engelman, Ronald; and Levine, Sheldon. Photographic surveillance apparatus. 3,709,121, Cl. 95-11.000.

Sims, Art T., to Addressograph-Multigraph Corporation. Data board and data recording machine. 3,709,144, Cl. 101-45.000.

Sinclair, Archibald R.: *See—*
Burcher, Ernest E.; Rowland, Carroll W.; and Sinclair, Archibald R., 3,710,122.

Singer Company, The: *See—*
Darboven, Ernest F.; and Solomon, Leon R., 3,710,386.
Kadar, Nicholas M., 3,710,249.
Kaupick, Walter J.; and Cimera, Richard F., 3,709,045.
King, Stanley; and Tierney, Peter R., 3,710,381.

Singer Company, The, mesne: *See—*
McGlasson, Frank W., 3,709,581.
Papajewski, Reinhold; and Gillessen, Erich, 3,709,176.

Singer-General Precision, Inc.: *See—*
Galowin, Lawrence S.; De Santis, Michael J.; and Miller, Cary, 3,709,041.

Singleton, Thomas C., to Monsanto Company. Purification of carboxylic acids by chemical treatment and distillation. 3,709,795, Cl. 203-31.000.

Sinkovitz, Gloria Dimarco: *See—*
Slagel, Robert Clayton; and Sinkovitz, Gloria Dimarco, 3,709,780.

SKB Arms Company: *See—*
Tazome, Masaru, 3,709,092.

Skeen, Lawrence: *See—*
Michel, Donald P.; Steinige, Herman; Landis, Franklin F.; and Skeen, Lawrence, 3,709,443.

Skillman, Jack J. Method of stacking nesting articles of diminishing size. 3,708,910, Cl. 46-17.000.

Skrupsky, Voldemar Petrovich: *See—*
Abramov, Viktor Petrovich; Junga, Yan Petrovich; Berzin, Gunard Valdemarovich; Skrupsky, Voldemar Petrovich; Frolov, Petr Nikolaevich; Lugovskoi, Andrei Lukyanovich; Shilgorin, Felix Alexandrovich; Dalbinsh, Yan Yanovich; Rotsen, Karl Arturovich; Ziemelis,Andris Eduardovich; Elksnis, Artur Yanovich; and Priede, Bruno Andreevich, 3,709,270.

Skubic, Leroy F., to Paltier Corporation, The. Pallet tiering frame structure. 3,709,164, Cl. 108-53.000.

Slagel, Robert Clayton; and Sinkovitz, Gloria Dimarco, to Calgon Corporation. Process and product for making paper products of improved dry strength. 3,709,780, Cl. 162-168.000.

Slagley, William E.; Seifert, Gerald R.; and Valonis, Edmund J., to Inland Steel Company. Non-contact strip coil linear footage measuring apparatus and method. 3,710,084, Cl. 235-151.320.

Slater, William L.: *See—*
Marion, Charles P.; Schlinger, Warren G.; and Slater, William L., 3,709,669.

Slates, Larry L.: *See—*
Looker, Olin L.; Zemke, Frederick A.; Knicely, David R.; Rouse, Russell V.; and Slates, Larry L., 3,709,231.

Sloane, Edwin A.; and Heizman, Charles L., to Time/Data Corporation. System for digitally controlling a vibration testing environment or apparatus. 3,710,082, Cl. 235-151.000.

Smart, David Ol, IV; Pennington, Grover B.; Plettner, Richard M.; and Maughan, Robert F., to BiO_2 Systems, Inc. Extended aeration, activated sludge plant. 3,709,363, Cl. 210-195.000.

Smedley, Richard W.; and Mack, Earl J., to Cerco Corporation. Stacking connection and locking device therefor. 3,709,163, Cl. 108-53.000.

Smirnov, Andrei Mikhailovich: *See—*
Lukhovitsky, Vladimir Isaakovich; Smirnov, Andrei Mikhailovich; Polikarpov, Vladimir Vasilievich; Lebedeva, Alla Mikhailovna; Lagucheva, Raisa Mizovna; and Karpov, Vladimir Lvovich, 3,709,804.

Smith, Andrew W., Jr., to Westinghouse Electric Corporation. Gauge control method and apparatus for metal rolling mills. 3,709,008, Cl. 72-8.000.

Smith, Aubrey H., to Eaton Corporation. SCR motor speed control with plug sensing circuit. 3,710,216, Cl. 318-373.000.

Smith, Donald K. Sportsman's blind. 3,709,237, Cl. 135-5.00r.

Smith, Donald O.; Harte, Kenneth J.; Cohen, Mitchell S.; Newberry, Sterling P.; and Speliotis, Dennis E., to Micro-Bit Corporation. High speed-large storage capability electron beam accessed memory method and apparatus. 3,710,352, Cl. 340-173.200.

Smith, Joseph L., Jr.: *See—*
Bush, Vannevar; and Smith, Joseph L., Jr., 3,708,979.

Smith Kline & French Laboratories: *See—*
Grooves, William G.; and Tillman, William J., 3,709,995.
Lafferty, John J.; and Zirkle, Charles L., 3,709,913.
Mlodzinski, John J., 3,709,329.

Smith Kline & French Laboratories Limited: *See—*
Bowden, Kenneth; Davis, Robin Alastair; Hills, Derek William; and Sach, George Sidney, 3,709,925.

Smith, Ralph David: *See—*
Lamb, Edward Lawrence; McAinsh, Kenneth Gordon; and Smith, Ralph David, 3,709,589.

Smith, Raymond L., Jr., to C & M Manufacturing Company, Inc. Carriage safety system. 3,709,331, Cl. 187-9.000.

Smith, Sidney H.: *See—*
Barrager, Stephen M.; and Smith, Sidney H., 3,710,235.

Smith, Sydney Edwin; O'Reilly, Kevin J.; and Prydie, John, to Burroughs Wellcome Co. Heteroploid cell lines. 3,709,782, Cl. 195-1.800.

Smithdeal, Charles D. Seat protective garment. 3,708,799, Cl. 2-46.000.

Smiths Industries Limited: *See—*
Constable, Geoffrey Ernest Patrick; and Holter, Godfrey George, 3,710,136.
Lamb, Edward Lawrence; McAinsh, Kenneth Gordon; and Smith, Ralph David, 3,709,589.

Snapp, Thomas C., Jr.: *See—*
Albers, Kenneth H.; Blood, Alden E.; and Snapp, Thomas C., Jr., 3,709,858.

Snyder, Herbert C.: *See—*
De Santis, Urbano J.; and Snyder, Herbert C., 3,709,672.

Snyder, Richard C.; Parmenter, Robert R.; and Suvada, Steve L., to Pullman Incorporated. Railway car interior wall structure. 3,709,157, Cl. 105-409.000.

Sobel, Jack. Figure contouring mask. 3,709,225, Cl. 128-254.000.

Societa Farmaceutici Italia: *See—*
Bernardi, Luigi; Bertazzoli,Cesare; Chieli, Tecla; and Maggioni, Paola, 3,709,893.

Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine: *See—*
Desgrandchamps, Guy; Hemmer, Henri; and Haurie, Michel, 3,709,952.

Societe Anonyme Poclain le Plessis-Belleville: *See—*
Gauchet, Yves M., 3,709,518.

Societe d'Applications des Machines Motrices: *See—*
Faisandier, Jacques, 3,709,257.

Societe de Traitements Electrolytiques et Electrothermiques: *See—*
Besson, Andre, 3,710,001.

Societe d'Etudes et de Recherches Magnetiques: *See—*
Nicoud, Gilbert, 3,710,291.

Societe d'Optique, Precision, Electronique et Mecanique, (SOPELEM): *See—*
Taisne, Jean, 3,709,611.

Societe Kuhn Freres & Cie, Societe en Commandit Simple: *See—*
Reber, Walter, 3,708,966.

Sodenkamp, Conrad Fred, Jr. Sliding door and window lock. 3,709,539, Cl. 292-145.000.

Sola Basic Industries, Inc.: *See—*
Borkovitz, Henry S., 3,710,233.
Peterson, Wesley G., 3,710,238.

Solatron Electronic Group Limited: *See—*
Bloomfield, John, 3,710,248.

Solomon, Leon R.: *See—*
Darboven, Ernest F.; and Solomon, Leon R., 3,710,386.

Sommer, Gilbert Robert: *See—*
Channell, Andrew Willis; Shikasho, Satoru; and Sommer, Gilbert Robert, 3,709,431.

Sonberg, Charles M., to Ampex Corporation. Bidirectional digital deskew circuit. 3,710,361, Cl. 340-174.10b.

Sony Corporation: *See—*
Kubota, Yasuharu, 3,710,013.
Matsushita, Takeshi, 3,710,206.
Ohsawa, Mitsuo, 3,710,146.
Sada, Tomohiko; Tsuchiya, Noriyuki; Amamiya, Tameo; Kaneda, Yoko; and Ohta, Kazuyuki, 3,710,195.
Sakai, Yoshio; Nakamura, Zenkichi; and Takahashi, Katsumasa, 3,710,038.
Yokoyama, Hideo, 3,710,142.

Sorensen, Peter F., to Franklin Electric Co., Inc. Synchronizes counting system for counting symmetrical signals during a time base. 3,710,262, Cl. 328-41.000.

Soroka, Joe F.: *See—*
Schulze, James R.; and Soroka, Joe F., 3,708,952.

Soule, Winsor, Jr.; and Efstathioun, John, to SCM Corporation. Plugboard selection of register orders for extraction of contents. 3,710,325, Cl. 340-172.500.
Soumerai, Henri; Hoody, Harold W., Jr.; Hamilton, Clark B.; and Blatt, James R., to Dunham-Bush, Inc. Method for separating oil from compressed gas. 3,708,959, Cl. 55-97.000.
Sowman, Harold G., to Minnesota Mining and Manufacturing Company. Refractory fibers and other articles of zirconia and silica mixtures. 3,709,706, Cl. 106-57.000.
Space-Age Control, Inc.: *See—*
Foster, Norman B.; Yeomans, Robert P.; and Daniels, Robert S., 3,708,902.
Spangenberg, Gerhard, to Marotha Scientific Controls, Inc. Valve control with dither. 3,709,253, Cl. 137-595.000.
Spector, Sidney, to Hoffmann-La Roche Inc. Opium alkaloid antigens and antibodies specific therefor. 3,709,868, Cl. 260-121.000.
Speedcranes Limited: *See—*
Morrison, Robert; and MacNeill, James Taylor, 3,709,375.
Speliotis, Dennis E.: *See—*
Smith, Donald O.; Harte, Kenneth J.; Cohen, Mitchell S.; Newberry, Sterling P.; and Speliotis, Dennis E., 3,710,352.
Spencer, Arthur: *See—*
Calton, Ernes; and Spencer, Arthur, 3,710,068.
Spencer, Glenn S., to Bendix Corporation, The. Time delay electromagnetic clutch. 3,709,342, Cl. 192-52.000.
Spengler, Erich; Boning, Horst; and Requardt, Heiko, to Volkswagenwerk AKT. Method and apparatus for optoelectronic axle measurement of motor vehicles. 3,709,609, Cl. 356-152.000.
Sperry Rand Corporation: *See—*
Daniels, John F., 3,710,224.
Strenglein, Harry F., 3,710,258.
Sposato, Frank J.: *See—*
Basse, Philip; and Sposato, Frank J., 3,710,274.
Sprague Electric Company: *See—*
Heron, John B., 3,710,210.
Herzig, Robert W., 3,710,225.
Sprague, James M.: *See—*
Ziegler, Carl; and Sprague, James M., 3,709,917.
Springman, Arthur, to Doering, A. L., Mfg. Folding stool. 3,709,167, Cl. 108-128.000.
Square D Company: *See—*
Horwell, John E., 3,710,308.
Squibb, E. R., & Sons, Inc.: *See—*
Czaplinski, Thomas V.; and Haney, Thomas A., 3,709,365.
Stach, Kurt: *See—*
Welmut, Weber; Weyer, Rudi; Aumuller, Walter; Muth, Karl; and Stach, Kurt, 3,709,908.
Stahlschmidt, Karl-Heinz: *See—*
Gebhardt, Otto; Luderer, Fred; and Stahlschmidt, Karl-Heinz, 3,709,434.
Stahr, Donald F.; and Dorwachter, Kirby D., to FMC Corporation. High power storage diode. 3,710,203, Cl. 317-234.00r.
Staley, A. E., Manufacturing Company: *See—*
Best, Roland W.; Doughty, Raymond A.; and Vander Burgh, Leonard F., 3,709,788.
Jones, Rexford W.; and Thompson, William B., 3,709,688.
Stamicarbon N.V.: *See—*
van Westerveld, Jan; and van Doorn, Jozeph Marie, 3,709,666.
Standard Oil Company (Indiana): *See—*
Alm, Robert M., 3,709,930.
Stanford Research Institute: *See—*
Johnson, David A.; and Wickersham, Arthur F., 3,710,178.
Stanley Works, The: *See—*
Rimmler, Fred F., 3,710,164.
Stannard, Forrest B. Tube coating film and apparatus. 3,709,642, Cl. 425-72.000.
Stapfer, Christian H., to Cincinnati Milacron Chemicals Inc. Bis (monoalkyltin) orthosulfites. 3,709,918, Cl. 260-429.700.
Stapp, Paul R., to Phillips Petroleum Company. Conversion of aldehydes to esters. 3,709,923, Cl. 260-408.00r.
Stapp, William C., to American Forest Products Corporation. Shipping carton and end panel construction therefor. 3,709,425, Cl. 229-23.00c.
Starbuck, James W.: *See—*
Pitt, Larry L.; and Starbuck, James W., 3,709,826.
Starks, Charles M.: *See—*
Gordon, Ronnie D.; and Starks, Charles M., 3,709,949.
Starling, James G., to Caterpillar Tractor Company. Compact fluid system for shifting a transmission. 3,709,065, Cl. 74-753.000.
Starp, Franz W. R., to Prontor-Werk Alfred Gauthier G.m.b.H. H. Automatic shutter controlling device particularly for photographic and moving picture apparatus. 3,709,137, Cl. 95-64.00d.
Staub, Fred W.; Corman, James C.; and Walmet, Gunnar E., to General Electric Company. Current limiting fuse. 3,710,295, Cl. 337-166.600.
Stauber, Siegfried; and Suttner, Klaus, to Dornier A.G. Coordinate transformer for transforming control signals in airplanes. 3,709,056, Cl. 74-469.000.
Stauffer Chemical Company: *See—*
Gutman, Arnold D., 3,709,959.
Uhing, Eugene H., 3,709,932.
Stegmeier, William J. Swimming pool seal structure. 3,708,930, Cl. 52-98.000.
Stein, Julian. Fish attracting means. 3,708,906, Cl. 43-100.000.
Steinberg, David Herbert: *See—*
Dexter, Martin; and Steinberg, David Herbert, 3,709,884.
Steinbruegge, Kenneth B.: *See—*
Hopkins, Richard H.; Roland, George W.; Partlow, William D.; and Steinbruegge, Kenneth B., 3,710,278.
Steinige, Herman: *See—*
Michel, Donald P.; Steinige, Herman; Landis, Franklin F.; and Skeen, Lawrence, 3,709,443.
Steininger, Hugh D.: *See—*
Howard, Donald W.; Eppley, Dewey W.; and Steininger, Hugh D., 3,710,385.
Stelitano, Salvatore. Tobacco pipe construction. 3,709,233, Cl. 131-176.000.
Steltz, Douglas C., to Portec, Inc. Refuse container. 3,709,389, Cl. 214-82.000.
Stender-Robertz, Jost, to Universal Maschinen- u. Apparatebau GmbH U. Co. KG. Metal-cutting apparatus. 3,709,096, Cl. 90-15.000.
Stepanek, Karel; and Jurny, Josef, to Adamovske strojirny, narodni podnik. Apparatus for mounting rollers in offset presses. 3,709,048, Cl. 74-53.000.
Stephan, Hallis N.; deceased (by Stephan, Katharine S.; executrix); and Seager, Leslie C., to New Britain Machine Company, The. Combined boring, drilling and milling machine. 3,709,623, Cl. 408-22.000.
Stephan, Katharine S.: *See—*
Stephan, Hallis N.; and Seager, Leslie C., 3,709,623.
Stephens, Albert Lee, Jr. Control system and method. 3,710,137, Cl. 307-141.000.
Stephenson, Charles F.; Van Dyck, Kenneth A.; and Wyatt, James B., to Gillette Company, The. Razor head. 3,708,879, Cl. 30-61.000.
Sterling Drug Inc.: *See—*
Jefferies, Patrick J.; and Crounse, Nathan N., 3,709,903.
Sterner, Russell L., to Kidde, Walter, & Company, Inc., mesne. Trapezoidal telescoping crane boom. 3,708,937, Cl. 52-118.000.
Stewart, Elmer R.: *See—*
Vandenberg, Willard J.; Chae, Hi Chul; Stewart, Elmer R.; Palmer, Wayne R.; and Padgitt, Howard R., 3,709,598.
Stewart, John L., to PPG Industries, Inc. Electrically heated multiple glazed window having an iridescence masking film. 3,710,074, Cl. 219-203.000.
Stoba AG: *See—*
Bienz, Hans, 3,708,835.
Stobaugh, Graham E. Transducer volume control for stringed musical instruments. 3,709,084, Cl. 84-1.150.
Stobo, James J., to Glacier Metal Company Limited, The. Method of making a fibre-reinforced plain bearing. 3,709,797, Cl. 204-16.000.
Stone, Edward: *See—*
Loew, Frederic Christian; Stone, Edward; and Civardi, Frank Peter, 3,709,864.
Stone, Wayne B., Jr. Torque limiting threaded fastener. 3,709,087, Cl. 85-61.000.
Stoy, Artur, to Ceskoslovenska Akademie ved. Porous hydrogels and method of manufacturing same. 3,709,842, Cl. 260-2.50r.
Strandberg, Bengt Sigurd Lennart; and Strandberg, Maj, to Hiab-Foco Ak. Loading tool having a loading fork. 3,709,394, Cl. 214-750.000.
Strandberg, Maj: *See—*
Strandberg, Bengt Sigurd Lennart; and Strandberg, Maj, 3,709,394.
Strandine, Eldon J.: *See—*
Hartman, Robert H.; and Strandine, Eldon J., 3,709,699.
Straub, Helmut, to Prontor-Werk Alfred Gauthier G.m.b.H. Photographic shutter. 3,709,136, Cl. 95-62.000.
Strazdins, Edward, to American Cyanamid Company. Wax emulsions. 3,709,708, Cl. 106-216.000.
Streeter, Paul W. Locking device for overhead garage door. 3,708,917, Cl. 49-280.000.
Strekalov, Genrikh Nikolaevich: *See—*
Belkovsky, Viktor Alexandrovich; Grzhimalsky, Leopold Leopoldovich; Ilievsky, Irma Irmovich; Lotsmanov, Sergei Nikolaevich; Petrunin, Ivan Egorovich; Sukhov, Anatoly Vasilievich; Tikhonov, Boris Sergeevich; Levin, Boris Isaakovich; Moroz, Pavel Kirillovich Strekalov, Genrikh Nikolaevich; Chernov, Andrei Nikolaevich; Chizhov, Sergei Ilich; and Shevyakov, Nikolai Nikolaevich, 3,709,682.
Strenglein, Harry F., to Sperry Rand Corporation. Impulse radiator system. 3,710,258, Cl. 325-105.000.
Strobel, Werner Karl: *See—*
Riehl, Wilhelm; and Strobel, Werner Karl, 3,710,093.
Strolee of California: *See—*
Hyde, Richard E., 3,709,454.
Strubin, Harald, to Aktiengesellschaft Brown, Boveri & Cie. Drive mechanism for electrical circuit breakers. 3,710,298, Cl. 337-401.000.
Stubiger, Ernst: *See—*
Frohlich, Alfons; Cappel, Marie-Luise; and Stubiger, Ernst, 3,708,836.
Stuit, Jack B.: *See—*
Duty, Cermillus H.; Stuit, Steven J.; and Stuit, Jack B., 3,708,958.
Stuit, Steven J.: *See—*
Duty, Cermillus H.; Stuit, Steven J.; and Stuit, Jack B., 3,708,958.
Stults, Howard C. Self-contained foam fire extinguishing system. 3,709,302, Cl. 169-9.000.
Stumpf, Robert J., to Kimberly-Clark Corporation. High-loft, nonwoven fabric. 3,709,768, Cl. 161-63.000.

Sturley, Richard A., to Carrier Corporation. Apparatus for bending mating tubular joint members. 3,709,757, Cl. 156-423.000.

Sturm, Walter V.; and Doll, Claude S., to Monarch Machine Tool Company, The. Tool changer. 3,709,377, Cl. 214-1.0bd.

Sud-Atlas-Werke G.m.b.H.: *See—*
Tupaj, Manfred Paul; and Engert, Heinz, 3,710,035.

Suda, Toshi; Kobayashi, Hisanori; and Nagata, Senichi, to Nippondenso Kabushiki Kaisha. Discharge controlled reciprocating pumps. 3,709,639, Cl. 417-493.000.

Sugahara, Yujiro; and Tanaka, Masanori, to Mizusawa Industrial Chemicals, Ltd. Method of manufacturing highly viscous, acidic base materials for detergents. 3,709,823, Cl. 252-136.000.

Suggitt, Robert M.; Estes, John H.; and Kravitz, Stanley, to Texaco Inc. Selective hydrocracking and isomerization of paraffin hydrocarbons. 3,709,817, Cl. 208-112.000.

Sugiyama, Yoshio: *See—*
Kanzaki, Toshihiko; Nakatsui, Isamu; Sugiyama, Yoshio; Nishio, Masaaki; and Ishikawa, Michio, 3,709,787.

Sukhov, Anatoly Vasilievich: *See—*
Belkovsky, Viktor Alexandrovich; Grzhimalsky, Leopold Leopoldovich; Ilievsky, Irma Irmovich; Lotsmanov, Sergei Nikolaevich; Petrunin, Ivan Egorovich; Sukhov, Anatoly Vasilievich; Tikhonov, Boris Sergeevich; Levin, Boris Isaakovich; Moroz, Pavel Kirillovich Strekalov, Genrikh Nikolaevich; Chernov, Andrei Nikolaevich; Chizhov, Sergei Ilich; and Shevyakov, Nikolai Nikolaevich, 3,709,682.

Sullivan, Norman M.; and Fitzgerald, Francis J., Jr., to Rapistan Incorporated. Cargo handling system and method. 3,709,381, Cl. 214-111.00r.

Suman, George O., Jr.; Murphey, Carey Epps, Jr.; Richardson, Edwin Allen; and Torrest, Robert Steven, to Shell Oil Company. Plating expanded boreholes. 3,709,299, Cl. 166-278.000.

Sumitomo Chemical Company, Ltd.: *See—*
Matsui, Masanao; Kato, Takeaki; Ueda, Kenzo; Mizutani, Toshio; Kitamura, Shigeyoshi; Fujimoto, Keimei; and Okuno, Yositosi, 3,709,910.

Summers, James E.: *See—*
Turner, Lyman H.; Kukucka, William P.; and Summers, James E., 3,709,595.

Sunbeam Lighting Co.: *See—*
Monte, Ernest; and Quadri, Syed H., 3,710,094.

Sundberg, Yngve S.: *See—*
Hammarlund, Per Erik G.; and Sundberg, Yngve S., 3,709,476.

Sunshine Mining Company: *See—*
Holmes, W. Church; and Coltrinari, Enzo L., 3,709,680.

Surridge, John H.: *See—*
Baird, William C., Jr.; and Surridge, John H., 3,709,921.

Susi, Peter Vincent. p-Quinonediimonium salts and their use as infrared absorbers. 3,709,830, Cl. 252-300.000.

Sustarsic, John D.: *See—*
Kinzler, Raymond C.; Edgar, William D.; and Sustarsic, John D., 3,709,794.

Susuki, Rinnosuke; Toyoda, Sadao; and Takenouchi, Kuniyoshi, to Lion Fat & Oil Co., Ltd. Methods of separating by-products sulfuric acid from mixtures resulting from photo-sulfoxidation reaction of paraffins. 3,709,807, Cl. 204-162.00r.

Suttner, Klaus: *See—*
Stauber, Siegfried; and Suttner, Klaus, 3,709,056.

Suvada, Steve L.: *See—*
Snyder, Richard C.; Parmenter, Robert R.; and Suvada, Steve L., 3,709,157.

Suzuki, Norio: *See—*
Tanaka, Kazunobu; Machida, Yasuhiko; Suzuki, Norio; and Kohashi, Tadao, 3,710,181.

Suzuki, Shoichi, to Diesel Kiki Kabushiki Kaisha. Hydraulic-type fuel-injection automatic timer. 3,709,001, Cl. 64-25.000.

Suzuki, Takeo: *See—*
Tanaka, Katsunobu; Suzuki, Takeo; Yamaguchi, Ken; and Yamamoto, Masaki, 3,709,783.

Svendsen, John A.: *See—*
Kreitz, Richard W.; and Svendsen, John A., 3,709,472.

Svensson, Lars-Ake Erling: *See—*
Carlsson, Sixten Einar; Myhr, Lars Halvar; and Svensson, Lars-Ake Erling, 3,709,335.

Svit, narodni podnik: *See—*
Jurasek, Jaromir; Mikac, Mojimar; and Podzimek, Karel, 3,708,815.

Swanson, John G., to Westinghouse Electric Corporation. Electronic components having improved ionic stability. 3,710,205, Cl. 317-234.00r.

Sweet, Douglas W.: *See—*
Van Ostrom, David L.; Sweet, Douglas W.; and Beyerlein, David G., 3,709,567.

Swinehart, Frank, to Johnson, E. F., Company. Microphone having improved piezoelectric transducer supports. 3,710,040, Cl. 179-110.00a.

Swithenbank, Colin: *See—*
McNulty, Patrick J.; Swithenbank, Colin; Viste, Kenneth L.; and von Meyer, William C., 3,709,897.

Switsen, Henry N. Flasher circuit. 3,710,185, Cl. 315-240.000.

Sybron Corporation: *See—*
Werner, Alan J., 3,710,139.

Sylvania Electric Products Inc.: *See—*
Cross, Donald John; Eckenbrecht, Robert Roy; Price, Arthur Burke; and Scott, Benton boyd, 3,710,012.

Sylvester, Willard G.; Boynton, Ira D.; and Bode, Robert H., to Lee, H. D., Company, Inc., The. Web alignment device. 3,709,418, Cl. 226-17.000.

Syntex Corporation: *See—*
Moffatt, John G.; and Russell, Alan F., 3,709,874.

Syvakari, Pertti: *See—*
Landa, Torstein; Syvakari, Pertti; and Westman, Erik, 3,709,014.

Syverson, Martelle J., to Fountain Industries, Inc. Beverage dispensing machine. 3,709,408, Cl. 222-129.400.

Tabasso, Giovanni: *See—*
Michellone, Giancarlo; Palazzetti, Mario; and Tabasso, Giovanni, 3,709,566.

Tabata, Norikazu: *See—*
Ito, Toshio; Nomaguchi, Tamotsu; and Tabata, Norikazu, 3,709,473.

Tabb, Durbin C., to Research Corporation. Method for hatching and growing marine organisms. 3,709,195, Cl. 119-2.000.

Taccone, Russell W., to Banger Punta Operations, Inc. Molding machine. 3,709,282, Cl. 164-187.000.

Tadini, Constantino: *See—*
Ullmann, Werner; Derighetti, Renato; Tadini, Constantino; Farinelli, Roberto; and Mattei, Silvano, 3,710,067.

Taisne, Jean, to Societe d'Optique, Precision, Electronique et Mecanique, (SOPELEM). Apparatus for deriving electrical signals. 3,709,611, Cl. 356-170.000.

Takahama, Teizo: *See—*
Yabe, Masaya; Takahama, Teizo; Kono, Masaru; and Hirono, Katsumi, 3,710,208.

Takahashi, Katsuhiro: *See—*
Fukuda, Masataro; Miura, Takashi; and Takahashi, Katsuhiro, 3,709,834.

Takahashi, Katsumasa: *See—*
Sakai, Yoshio; Nakamura, Zenkichi; and Takahashi, Katsumasa, 3,710,038.

Takahashi, Kazuyoshi: *See—*
Deguchi, Yutaka; Kashihara, Hideo; Koozuki, Rikuzo; Takahashi, Kazuyoshi; and Ikeda, Mitsuyuki, 3,708,962.

Takahashi, Norio: *See—*
Shiozaki, Hiroyuki; and Takahashi, Norio, 3,709,009.

Takahashi, Tadashi; and Onishi, Kazuo, to Hitachi, Ltd. Speed control system for DC motors. 3,710,219, Cl. 318-331.000.

Takahashi, Toshiro, to Riken Right Metal Industries Co., Ltd. Openable architectural fitting with alarm. 3,710,369, Cl. 340-274.000.

Takatsu, Toshiharu: *See—*
Hirai, Masuhiko; Takatsu, Toshiharu; Hashimoto, Kazuyoshi; and Hozoji, Akira, 3,709,007.

Takeda Chemical Industries, Ltd.: *See—*
Kamada, Masaki; and Okauchi, Tetsuo, 3,709,990.
Kanzaki, Toshihiko; Nakatsui, Isamu; Sugiyama, Yoshio; Nishio, Masaaki; and Ishikawa, Michio, 3,709,787.

Takenouchi, Kuniyoshi: *See—*
Susuki, Rinnosuke; Toyoda, Sadao; and Takenouchi, Kuniyoshi, 3,709,807.

Takeuchi, Yoji: *See—*
Ohata, Shuichi; Takeuchi, Yoji; and Ishiguro, Takeshi, 3,710,089.

Takikawa, Toshio; Satomo, Kouji; and Kodama, Takashi, to Osaka Soda Co., Ltd. Phthalate polymer impregnated sheet. 3,709,777, Cl. 161-232.000.

Tamar Electronics, Inc.: *See—*
Apitz, Peter F., 3,710,081.

Tamura, Hifumi: *See—*
Kondo, Toshio; and Tamura, Hifumi, 3,710,266.

Tanabe, Takako: *See—*
Sato, Junzi; and Tanabe, Takako, 3,709,749.

Tanaka, Katsunobu; Suzuki, Takeo; Yamaguchi, Ken; and Yamamoto, Masaki, to Kyowa Hakko Kogyo Co., Ltd. Process for producing proteins by fermentation. 3,709,783, Cl. 195-28.00r.

Tanaka, Kazunobu; Machida, Yasuhiko; Suzuki, Norio; and Kohashi, Tadao, to Matsushita Electric Industrial Company, Limited. Solid-state image intensifier. 3,710,181, Cl. 315-175.000.

Tanaka, Masanori: *See—*
Sugahara, Yujiro; and Tanaka, Masanori, 3,709,823.

Tanaka, Ryuji; and Yasuno, Akio, to Tokyo Tanabe Company, Limited. Process for preparing d-ribonolactone. 3,709,912, Cl. 260-343.600.

Tanaka, Tetsuro; and Bansho, Kiyoshi, to Shigeru Kakubari. Low frequency oscillator employing a pair of U-shaped mechanical vibrators. 3,710,275, Cl. 331-37.000.

Tanguay, Jean Paul, to Placements Jean Paul Tanguay Limitee, mesne. Sawing and discharging station for a tree slasher. 3,709,265, Cl. 143-46.00f.

Tanguay, Jean Paul, to Placements Jean Paul Tanguay Ltee, mesne. Heel boom construction. 3,709,390, Cl. 214-147.0as.

Tani, Kaneyasu; Kawazoe, Shiro; Eto, Mikio; Okamots, Sunao; and Fujino, Tamotsu, to Japan Synthetic Paper Company Ltd. and Oriental Photo Industrial Co., Ltd. Copying materials for photographic reflection printing. 3,709,691, Cl. 96-87.00r.

Tannert, Karl. Positive thread feeder for circular knitting machines with a plurality of knitting points. 3,709,444, Cl. 242-47.040.

Tantlinger, Keith W., to Rohr Industries, Inc. Stainless steel clad aluminum strakes and panels. 3,708,938, Cl. 52-471.00.

Tapeswitch Corporation of America: *See—*

Koenig, Robert H., 3,710,054.

Tarhan, Mehmet Orhan, to Bethlehem Steel Corporation. Gas desulfurization process. 3,709,976, Cl. 423-224.000.

Tarney, Robert Edward; and Verban, John J., to Du Pont de Nemours, E. I., and Company. Elastomer having improved building tack. 3,709,924, Cl. 260-47.0op.

Tarui, Yasuo: *See—*
Hayashi, Tutaka; and Tarui, Yasuo, 3,710,041.

Tatsumi, Setsuo, to Nippon Kokan Kabushiki Kaisha. Method for automatically controlling thickness of a workpiece in a rolling mill. 3,709,010, Cl. 72-8.000.

Taubitz, Bernd: *See—*
Bachle, Karl; Finkbeiner, Ludwig; and Taubitz, Bernd, 3,710,158.

Tax, Hans: *See—*
Tax, Hans; and Franke, Rudiger (said Franke assor. to said), 3,709,543.

Tax, Hans; and Franke, Rudiger, said Franke assor. to said Tax, Hans. Loading crane for shipping containers of different size. 3,709,543, Cl. 294-81.000.

Taylor, David Robin: *See—*
Haszeldine, Robert Neville; Banks, Ronald Eric; and Taylor, David Robin, 3,709,948.

Taylor, Gerald A., to Rochester Envelope Company. Method of applying windows to envelopes and bags. 3,709,753, Cl. 156-108.000.

Tazome, Masaru, to SKB Arms Company. Gas-operated cartridge feeding system for tubular magazine firearms. 3,709,092, Cl. 89-191.000.

Teaff, Miriam M. Collapsible coiffure covering. 3,708,803, Cl. 2-198.000.

Technical Management Services, Inc.: *See—*
Gilbert, Roswell W., 3,710,135.

Technical Wire Products, Inc., mesne: *See—*
Mintz, Ezra, 3,708,871.

Technicon Instruments Corporation: *See—*
Lichtenstein, Bernard, 3,709,791.

Technological Products, Inc.: *See—*
Schmidgall, William M., 3,709,208.

Tedeschi, Robert J.; and Moore, George L., to Air Products and Chemicals, Inc., mesne. Preparation of acetylenic alcohols. 3,709,946, Cl. 260-617.00e.

Tee-Pak, Inc.: *See—*
McNeill, Frank M., 3,709,703.

Tektronix, Inc.: *See—*
Addis, John L.; and Peltola, Ronald W., 3,710,270.
Hayes, Raymond; and Hayward, Wesley H., 3,710,179.
Hutchins, Thomas B., IV; and Templeton, William M., 3,710,173.

Tele Cash, Inc.: *See—*
Brewer, Donald R.; and Schipper, Richard A., 3,710,085.

Telefonaktiebolaget L M Ericsson: *See—*
Andersson, Tage Vilhelm Leander; Isheden, Lars Rune; Johansson, Bo Emil; and Warring, Stig Erik, 3,710,372.

Telefunken Patentverwerlungsgesellschaft m.b.H.: *See—*
Batz, Monika, 3,710,204.

Templeton, John Glenn; and Seitz, Calvin W., to Rospatch Corporation. Label package assembly. 3,709,402, Cl. 221-33.000.

Templeton, William M.: *See—*
Hutchins, Thomas B., IV; and Templeton, William M., 3,710,173.

Tenneco Inc.: *See—*
Malkiewicz, Wladyslaw F., 3,709,321.

Tennessee Jed's Franchise Corporation: *See—*
Rickhoff, Leo J., Jr., 3,709,140.

Terbay, Joseph J.: *See—*
Nelson, Carl R.; Cattorini, Joseph F.; and Terbay, Joseph J., 3,709,482.

Terron, Christopher: *See—*
Lemon, Peter Herbert Richard Bryan; and Terron, Christopher, 3,709,849.

Terry, Peter L.: *See—*
Adlhart, Otto J.; and Terry, Peter L., 3,709,736.

Terzian, Reuben; McKay, Robert S.; and Glass, Marvin I., to Glass, Marvin, & Associates. Toy motorcycle. 3,708,913, Cl. 46-243.0lv.

Texaco Inc.: *See—*
Christopher, Charles A., Jr.; Grimm, Henry J.; and Nute, Alton J., 3,709,297.
Marion, Charles P.; Schlinger, Warren G.; and Slater, William L., 3,709,669.
Pogonowski, Ivo C.; and Carmichael, Paul D., 3,708,985.
Pruitt, William H., 3,709,366.
Suggitt, Robert M.; Estes, John H.; and Kravitz, Stanley, 3,709,817.

Texas Instruments, Incorporated: *See—*
Johnson, Rowland Edward; and Trachtenberg, Isaac, 3,709,813.

Textol Systems, Inc.: *See—*
Zaruba, Wenzel; and Sehnal, Jan, 3,709,047.

Textron, Inc.: *See—*
Howe, Ralph S., Jr., 3,709,575.
Pethis, James J., 3,709,572.
Potter, Howell L., 3,709,574.

Thermo-Chem Systems, Inc.: *See—*
Cettin, Edward J.; Pappas, Jimmy P.; and Lager, Sam E., 3,709,203.

Thiokol Chemical Corporation: *See—*
Jackson, Charles A.; and Katz, Martin B., 3,709,263.

Thode, Horst, to Finzer, Heinz, K.G. Automatic bending and/or punching machines for producing shaped parts from wire or strip. 3,709,023, Cl. 72-402.000.

Thoma, Paul E.; and Hoffmann, frederick A., to Johnson Service Company. Method of making a temperature sensing element. 3,708,863, Cl. 29-454.000.

Thomas, Delmer L., to International Telephone and Telegraph Corporation. Lossless n-port frequency multiplexer. 3,710,281, Cl. 333-6.000.

Thomas, George E.; and Krehel, John J., Jr., to Olin Corporation. Aluminum facing and roofing sheet system. 3,708,943, Cl. 52-588.000.

Thomas, Gordon D., to Kimberly-Clark Corporation. Heavy-duty wipe and method for producing same. 3,709,764, Cl. 156-177.000.

Thomas, Ian M., to Owens-Illinois, Inc. Process for preparing high purity silicon oxide porous beads doped with small quantities of other oxides. 3,709,833, Cl. 252-448.000.

Thomeer, Johannes H. M.: *See—*
Coles, Roy D., Jr.; Thomeer, Johannes H. M.; and Chase, Curtis A., Jr., 3,709,032.

Thomen, Max. Ultrasonic dishwasher. 3,709,732, Cl. 134-57.00d.

Thompson, David L.: *See—*
Nutter, John F.; Haas, Frank C.; and Thompson, David L., 3,709,974.

Thompson, John T.: *See—*
Anderson, Karl R., 3,710,046.
Gillemot, George W.; and Thompson, John T., 3,710,004.

Thompson, William B.: *See—*
Jones, Rexford W.; and Thompson, William B., 3,709,688.

Thomson, Elihu Craig, to Electronics Corporation of America. Electrical circuitry. 3,710,149, Cl. 307-310.000.

Thomson, Jackie D.: *See—*
Anderson, Quinn S.; Levin, Berton P.; and Thomson, Jackie D., 3,709,192.

Ti-Mind Incorporated: *See—*
Jochim, La Vergne C., 3,710,045.

Tierney, Peter R.: *See—*
King, Stanley; and Tierney, Peter R., 3,710,381.

Tijunelis, Donatas: *See—*
Hoeg, Donald F.; Legg, Leo V.; and Tijunelis, Donatas, 3,710,007.
Hoeg, Donald F.; Legg, Leo V.; and Tijunelis, Donatas, 3,710,009.

Tikhonov, Boris Sergeevich: *See—*
Belkovsky, Viktor Alexandrovich; Grzhimalsky, Leopold Leopoldovich; Ilievsky, Irma Irmovich; Lotsmanov, Sergei Nikolaevich; Petrunin, Ivan Egorovich; Sukhov, Anatoly Vasilievich; Tikhonov, Boris Sergeevich; Levin, Boris Isaakovich; Moroz, Pavel Kirillovich Strekalov, Genrikh Nikolaevich; Chernov, Andrei Nikolaevich; Chizhov, Sergei Ilich; and Shevyakov, Nikolai Nikolaevich, 3,709,682.

Till, James Peter, to AMP Incorporated. High voltage divider unit. 3,710,252, Cl. 324-126.000.

Tillman, William J.: *See—*
Grooves, William G.; and Tillman, William J., 3,709,995.

Time/Data Corporation: *See—*
Sloane, Edwin A.; and Heizman, Charles L., 3,710,082.

Timesavers, Inc., mesne: *See—*
Rhine, Wallace R.; and Kiser, Fred W., 3,708,817.

Timofeev, Alexandr Andrianovich: *See—*
Perelman, Simon Meerovich; Petrenko, Evgraf Efremovich; Prager, Isaak Aronovich; Timofeev, Alexandr Andrianovich; and Tolmachev, Anatoly Filippovich, 3,710,166.

Timor, Uzi: *See—*
National Aeronautics and Space Administration, 3,710,257.

Tischner, Horst; Schief, Alfred; and Baur, Hugo, to Federal Republic of Germany, as represented by the Federal Defense Minister. Method and apparatus for finding the direction of signals. 3,710,332, Cl. 343-113.00r.

Tittus, Hans: *See—*
Dobler, Johann; Hausner, Leopold; Kolbe, Andreas; and Tittus, Hans, 3,709,649.

T'Jampens, Germain Remi; Notelteirs, Victor Rosallie; and Janssen, Eduard Jozef Philomena, to U.S. Philips Corporation. Halogen filament lamp having an internal arc protection arrangement. 3,710,169, Cl. 313-222.000.

TNE Incorporated: *See—*
Aselman, Edward C., Jr., 3,709,030.

Tochitani, Yutaka: *See—*
Neu, Kazuo; and Tochitani, Yutaka, 3,710,326.

Toepfl, Rosemarie; Abel, Heinz; and Maeder, Arthur. Preparations of reaction products of epoxides, fatty amines and basic polyamides, processes for their manufacture and their use. 3,709,847, Cl. 260-18.0pn.

Tokushige, Hiroyuki: *See—*
Iguchi, Jintaro; and Tokushige, Hiroyuki, 3,709,638.

Tokutomi, Seijiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Flash illumination of photographed object. 3,709,123, Cl. 95-11.50r.

Tokyo Electric Power Co., The: *See—*
Watanabe, Seizi; Ozaki, Kozo; Oishi, Hiroshi; Aoki, Fumio; and Kawano, Shigeru, 3,710,373.

Tokyo Shibaura Electric Co.: *See—*
Tsuneta, Asahide; and Sawagata, Shinichi, 3,710,165.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Abe, Takuzi; and Yuda, Minoru, 3,710,017.
Matsumoto, Yushi; Ozawa, Tunahiro; Ochiai, Tadashi; and Sakai, Masaomi, 3,709,593.

Watanabe, Ryuji; and Watanabe, Masayuki, 3,709,723.
Tokyo Shibaura Electric Company, Ltd.: *See—*
Nakamura, Takeshi, 3,710,239.
Tokyo Tanabe Company, Limited: *See—*
Tanaka, Ryuji; and Yasuno, Akio, 3,709,912.
Tolmachev, Anatoly Filippovich: *See—*
Perelman, Simon Meerovich; Petrenko, Evgraf Efremovich; Prager, Isaak Aronovich; Timofeev, Alexandr Andrianovich; and Tolmachev, Anatoly Filippovich, 3,710,166.
Tomalia, Donald A.; and Ojha, Narayanlal D., to Dow Chemical Company, The. Aminoethylation reaction and products thereof. 3,709,904, Cl. 260-307.00f.
Tomita, Kuniyuki: *See—*
Yoshida, Norio; Tomita, Kuniyuki; and Iizuka, Yoshio, 3,709,906.
Tomozawa, Atsushi, to Nippon Electric Company, Limited. Time-division multiplex delta-modulation communication system. 3,710,056, Cl. 179-15.0by.
Tonsbeek, Christiaan Herman Theodoor: *See—*
de Groot, Cornelis Nicolaas; Hobbs, John S.; and Tonsbeek, Christiaan Herman Theodoor, 3,709,697.
Toray Industries, Inc.: *See—*
Minami, Muneyoshi, 3,709,862.
Minami, Satoyuki; Shinke, Yoshiaki; Saito, Ahozi; and Osakada, Atsushi, 3,709,806.
Tori, Kazuo: *See—*
Kondo, Eiji; Mitsugi, Takashi; and Tori, Kazuo, 3,709,789.
Torii, Nozomu: *See—*
Kazaoka, Kenichi; and Torii, Nozomu, 3,709,537.
Torok, Andrew; and Walsh, Thomas F., to Georgia Kaolin Company. Kaolin derived pigments and methods of producing the same. 3,709,709, Cl. 106-288.00b.
Torrest, Robert Steven: *See—*
Suman, George O., Jr.; Murphey, Carey Epps, Jr.; Richardson, Edwin Allen; and Torrest, Robert Steven, 3,709,299.
Townsend, Robert L.: *See—*
Colsen, Frank Thomas; Kaufman, Peter; and Townsend, Robert L., 3,710,317.
Toyoda, Sadao: *See—*
Susuki, Rinnosuke; Toyoda, Sadao; and Takenouchi, Kuniyoshi, 3,709,807.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ito, Shin, 3,709,067.
Trachtenberg, Isaac: *See—*
Johnson, Rowland Edward; and Trachtenberg, Isaac, 3,709,813.
Traut, Earl W. Integrated flow gas turbine. 3,709,629, Cl. 415-56.000.
Trautvetter, Werner: *See—*
Fuchs, Otto; Bier, Gerhard; and Trautvetter, Werner, 3,709,776.
Traylor, John B. Method of dealing predetermined hands. 3,709,501, Cl. 273-149.00p.
Trefzer, Robert, to Ciba-Geigy AG. Gas washing bottle. 3,709,471, Cl. 261-124.000.
Trepanier, Maurice A., to Royal Oak Charcoal Company. Apparatus for activating comminuted material. 3,708,888, Cl. 34-169.000.
Tresch, Erwin Josef: *See—*
De Fries, Jan Richard Peter; and Tresch, Erwin Josef, 3,709,035.
Triangle Service Inc.: *See—*
Glenn, James J., Jr., 3,709,296.
Trible, Graydon E. Self-leveling steps. 3,709,323, Cl. 182-115.000.
Tripp, Terence Gordon, to Monsanto Chemicals Limited. Production of alkyl silicates. 3,709,801, Cl. 204-59.000.
Trogan, John F.; and Beebe, James H., to Bretting, C. G., Manufacturing Co., Inc. Cut-off device. 3,709,077, Cl. 83-152.000.
Trola-Kunststofferzeugnisse Gesellschaft mit Beschrankter Haftung & Co.: *See—*
Lauterbach, Heinrich, 3,709,541.
Trossinger Metallstimmenfabrik Hans Eisen: *See—*
Ashmele, Anton, 3,709,505.
Trueb, Viktor; and Hesener, Walter. Adhesive tape dispensers. 3,709,761, Cl. 156-576.000.
Truxell, Robert W., to General Motors Corporation. Internal combustion engine and method of operation. 3,708,980, Cl. 60-274.000.
TRW Inc.: *See—*
Cook, Harvey A., 3,709,201.
Dumeah, Peter J., 3,709,099.
Galbato, Anthony T., 3,709,570.
Tsai, Chern H. Comb and pin mirror. 3,709,585, Cl. 350-305.000.
Tsou, Ivan H., to Ford Motor Company. Trimellitic anhydride modified polycarboxylic acid electrocoating resins. 3,709,846, Cl. 260-18.0ep.
Tsuchiya, Noriyuki: *See—*
Sada, Tomohiko; Tsuchiya, Noriyuki; Amamiya, Tameo; Kaneda, Yoko; and Ohta, Kazuyuki, 3,710,195.
Tsujimoto, Kazumi N.: *See—*
Shrader, Robert L.; and Tsujimoto, Kazumi N., 3,710,072.
Tsukamoto, Kenkichi. Magnetic coating of iron surface. 3,709,730, Cl. 117-238.000.
Tsukihoshi Gomu Kabushiki Kaisha: *See—*
Ainoura, Masato, 3,708,925.
Tsuneta, Asahide; and Sawagata, Shinichi, to Tokyo Shibaura Electric Co. Shadow mask perforated along intersection of side wall and reinforcing flange. 3,710,165, Cl. 313-85.00s.
Tsuruta, Tadao, to Nippon Kogaku K.K. Holographic interferometry for rotating objects. 3,709,605, Cl. 356-109.000.
Tsutsui, Nobuhiro: *See—*
Shimoda, Keitaro; Tsutsui, Nobuhiro; Zoda, Keiichi; and Ueki, Masayuki, 3,709,971.
Tuggle, William H., Jr.: *See—*
Anderson, Charles B.; and Tuggle, William H., Jr., 3,708,834.
Tuman, Daniel: *See—*
Ghafghaichi, Majid; and Tuman, Daniel, 3,710,207.
Tunc, Deger, to Johnson & Johnson. Process for the sulfation of cellulosic ethers. 3,709,877, Cl. 260-232.000.
Tundermann, John Hayes; and Harrington, John Herbert, to International Nickel Company, Inc., The. Production of reflective metal flake pigments. 3,709,439, Cl. 241-15.000.
Tupaj, Manfred Paul; and Engert, Heinz, to Sud-Atlas-Werke G.m.b.H. Housing and speaker arrangement for magnetic sound recording and reproduction device. 3,710,035, Cl. 179-100.20z.
Turban, Josef: *See—*
Kuehnemann, Karl; and Turban, Josef, 3,710,240.
Turbo Machine Company: *See—*
Lohrke, James L., 3,708,832.
Turn-Styles Limited, mesne: *See—*
Hicks, Mervyn Lance, 3,709,196.
Turner, Luis A. Method and apparatus for making stereoscopic drawings. 3,708,884, Cl. 33-20.00r.
Turner, Lyman H.; Kukucka, William P.; and Summers, James E., to Xerox Corporation. Printer system. 3,709,595, Cl. 355-14.000.
Turner, Lynn H., to Xerox Corporation. Method for magnetic development. 3,709,713, Cl. 117-17.500.
Tuuha, Rolf Erik. Drum barker. 3,709,268, Cl. 144-208.00b.
Uchiyama, Mitsuru: *See—*
Kunichika, Sango; Sakaibara, Yasumasa; Kyotofu, Noguchi; Akio, Kurisaki; Konomu, Kato; and Uchiyama, Mitsuru, 3,709,927.
Ueda, Kenzo: *See—*
Matsui, Masanao; Kato, Takeaki; Ueda, Kenzo; Mizutani, Toshio; Kitamura, Shigeyoshi; Fujimoto, Keimei; and Okuno, Yositosi, 3,709,910.
Ueki, Masayuki: *See—*
Shimoda, Keitaro; Tsutsui, Nobuhiro; Zoda, Keiichi; and Ueki, Masayuki, 3,709,971.
Uhing, Eugene H., to Stauffer Chemical Company. Phosphorous dichlorides. 3,709,932, Cl. 260-543.00p.
Uhlmann, Erich, to Allmanna Svenska Elektriska Aktiebolaget. Harmonic filter. 3,710,284, Cl. 333-75.000.
Ullmann, Werner; Derighetti, Renato; Tadini, Constantino; Farinelli, Roberto; and Mattei, Silvano, to A. F. fur Industrielle Elektronik Agie. Method and apparatus for widening the field of application of electro-erosion machining and improving the conditios arising in the work gap. 3,710,067, Cl. 219-69.00c.
Ulmer, Arnold G., to GAF Corporation. Automatic diazo copier. 3,709,596, Cl. 355-109.000.
Ulrich, Peter Conrad: *See—*
Herter, Eberhard; and Ulrich, Peter Conrad, 3,710,027.
Underwood, Cyril James, to Seals, Dowty, Limited. Fluid sealing devices. 3,709,507, Cl. 277-188.000.
Underwriters Safety Device Co.: *See—*
Shea, Gerald J.; and Marach, David R., 3,710,090.
Union Carbide Corporation: *See—*
Hamling, Bernard H., 3,709,717.
Karapinka, George L., 3,709,853.
Karol, Frederick J.; and Karapinka, George L., 3,709,954.
Warner, Glenn H., 3,709,881.
Union Oil Company of California: *See—*
Pye, David S., 3,709,300.
Sarem, Amir M., 3,709,641.
United Aircraft Corporation: *See—*
Halpern, Howard S., 3,710,175.
Iwanciow, Bernard L.; and Holzman, Allen L., 3,709,652.
Putnam, James A., 3,710,271.
United Kingdom Atomic Energy Authority: *See—*
Fowler, Eliot Patrick; and Greaves, Richard William, 3,710,269.
United Kingdom of Great Britan and Northern Ireland, Secretary of State for Defense in her Britannic Majesty's Government of the: *See—*
Petrie, James Alexander; Gardiner, Terence Edward Gouvenot; and Clampitt, John Aaron, 3,709,637.
United Research Laboratory: *See—*
Adams, George; and Hawkins, John, 3,710,037.
United States of America
Agriculture: *See—*
Keating, Esmond J.; Haydel, Chester H.; and Knoepfler, Nestor B., 3,709,005.
Air Force: *See—*
McDowell, Curtis S.; and Barnes, Michael W., 3,709,920.
Roberto, Francisco Q., 3,709,748.
Health, Education, and Welfare: *See—*
Bedrosian, Paul H., 3,710,121.
Saunders, Alex Michael, 3,709,811.
National Aeronautics and Space Administration: *See—*
Burcher, Ernest E.; Rowland, Carroll W.; and Sinclair, Archibald R., 3,710,122.
Hendricks, Herbert D., 3,709,663.
Mailloux, Robert J.; and Caron, Paul R., 3,710,329.
Navy: *See—*
Costley, Vivian G.; and Wolf, Sylvan, 3,709,148.
Degnan, William J.; and Samsel, Richard W., 3,709,608.
Fugitt, Ronald B.; and Heckman, Paul J., Jr., 3,709,580.

Heeren, Vernon L., 3,710,389.
Hinchman, Walter R.; Adrian, Donald J.; and Walters, Andrew W., 3,710,387.
Navy, mesne: *See—*
Moss, George J., Jr.; and Walsh, George M., 3,710,310.
United States Rubber Company: *See—*
Von Schmeling, Bogislav; Harrison, William A.; and Kulka, Marshall, 3,709,992.
United States Steel Corporation: *See—*
Bower, John E., Jr., 3,709,286.
Goodman, Stephen R.; and Hu, Hsun, 3,709,744.
Shapland, James Thomas, 3,709,411.
Universal Maschinen- u. Apparatebau GmbH U. Co. KG: *See—*
Stender-Robertz, Jost, 3,709,096.
Universal Oil Products Company: *See—*
Hamblin, Robert J. J., 3,709,983.
McGregor, Eugene R., 3,709,427.
Predikant, Hans H., 3,709,978.
Urban, Peter, 3,709,660.
Universal Valve Company, Inc.: *See—*
Milo, August, 3,709,240.
Upjohn Company, The: *See—*
Hester, Jackson B., Jr., 3,709,898.
Hester, Jackson B., Jr., 3,709,899.
Klettke, Walter G., 3,708,945.
Upmeier, Hartmut, to Windmoller & Holscher. Cooling equipment for tubular plastics film made by a blowhead. 3,709,290, Cl. 165-47.000.
Urani, Angelo, to McGraw-Edison Company. Protector for electric circuits. 3,710,296, Cl. 337-213.000.
Urban, Peter, to Universal Oil Products Company. Catalytic treatment of thiosulfate containing solution with hydrogen to produce sulfide. 3,709,660, Cl. 427-566.000.
Urs Systems Corporation: *See—*
Orshansky, Elias, Jr., 3,709,060.
Orshansky, Elias, Jr., 3,709,061.
U.S. Philips Corporation: *See—*
Bruinsma, Anne Hendrik, 3,710,379.
Pax, Wilhelmus Petrus Johannes Franciscus; and Rooy, Henricus Johannes Van, 3,710,289.
Ritzen, Johannes Maria Jozef; and Peloschek, Hans Peter, 3,709,822.
Schroder, Johann, 3,709,209.
Sharp, Denis, 3,710,186.
T'Jampens, Germain Remi; Notelteirs, Victor Rosallie; and Janssen, Eduard Jozef Philomena, 3,710,169.
Van Dijk, Jan; Zwagemakers, Johannes; and Van Houtenlaan, Maria Antonius, 3,709,911.
Welling, Leo Johannes Maria, 3,710,366.
USM Corporation: *See—*
Barton, George C., 3,708,814.
Vadekar, Mohan: *See—*
Zimmerman, Abraham A.; Furlong, Louis E.; and Vadekar, Mohan, 3,709,668.
Valade, Victor D., to General Motors Corporation. Lifting jack. 3,709,465, Cl. 254-95.000.
Valencour, Frederick H.: *See—*
McGough, Gregory J., 3,709,312.
Valonis, Edmund J.: *See—*
Slagley, William E.; Seifert, Gerald R.; and Valonis, Edmund J., 3,710,084.
Valverde, Manuel. Fishing rod holder. 3,709,448, Cl. 248-46.000.
Van Der Meer, Jan. Close-up photographic system. 3,709,119, Cl. 95-11.00r.
Van Dijk, Jan; Zwagemakers, Johannes; and Van Houtenlaan, Maria Antonius, to U.S. Philips Corporation. [(Thenylidene amino) oxy] alkyl carboxylic acid and salts and esters thereof. 3,709,911, Cl. 260-332.20a.
van Doorn, Jozeph Marie: *See—*
van Westerveld, Jan; and van Doorn, Jozeph Marie, 3,709,666.
Van Dyck, Kenneth A.: *See—*
Stephenson, Charles F.; Van Dyck, Kenneth A.; and Wyatt, James B., 3,708,879.
Van Galen, Piet: *See—*
Boonstra, Willem Frederik; Meindersma, Tabe Ernst; and Van Galen, Piet, 3,708,963.
Van Gelder, Louis Ralph, to Chicago Bridge & Iron Company. Sludge feed system for incinerator. 3,709,170, Cl. 110-8.00r.
Van Houtenlaan, Maria Antonius: *See—*
Van Dijk, Jan; Zwagemakers, Johannes; and Van Houtenlaan, Maria Antonius, 3,709,911.
Van Nice, Robert I., to Westinghouse Electric Corporation. Electrical windings. 3,710,292, Cl. 336-60.000.
Van Ostrom, David L.; Sweet, Douglas W.; and Beyerlein, David G., to General Motors Corporation. Adaptive control anti-lock brake system. 3,709,567, Cl. 303-21.0be.
Van Poppel, Gebrs., N.V.: *See—*
Beijering, Willem, 3,709,655.
Van Reenen, Robert Theodore. Circuit producing candle-flicker light output from lamp. 3,710,182, Cl. 315-199.000.
Van Spankeren, Ulrich: *See—*
Gordon, Wolfgang; Kleiner, Hans-Jerg; and Van Spankeren, Ulrich, 3,709,852.
van Westerveld, Jan; and van Doorn, Jozeph Marie, to Stamicarbon N.V. Process of recovering ammonium sulphate from an aqueous solution containing ammonium sulphate and methionine. 3,709,666, Cl. 23-300.000.
Vandenberg, Willard J.; Chae, Hi Chul; Stewart, Elmer R.; Palmer, Wayne R.; and Padgitt, Howard R., to Lilly, Eli, and Company. Optical system for capsule inspection. 3,709,598, Cl. 356-198.000.
Vander Burgh, Leonard F.: *See—*
Best, Roland W.; Doughty, Raymond A.; and Vander Burgh, Leonard F., 3,709,788.
Vanderbilt, R. T., Company, Inc.: *See—*
Dehoff, Ronald L., 3,709,840.
Vann, Roy R. Method and apparatus for determining communication of a perforated zone with a second zone. 3,710,114, Cl. 250-83.60w.
Varga, John F., to Weldum Tool and Engineering Co. Adjustable feed apparatus for strip material. 3,709,419, Cl. 226-67.000.
Varian Associates: *See—*
Helmer, John C., 3,710,103.
Vartiak, Joseph F., to Nalco Chemical Company. Herbicidally active compositions. 3,709,676, Cl. 71-92.000.
Vaughan, Donald R. Conduit puller. 3,709,546, Cl. 294-96.000.
VeNard, Dan I., II, to Gates Learjet Corporation. Commutation circuit for power inverters. 3,710,230, Cl. 321-45.00c.
Verban, John J.: *See—*
Tarney, Robert Edward; and Verban, John J., 3,709,924.
Verbeke, Henry, to APL Corporation. Bag vending machine having feeler controlled lock. 3,709,347, Cl. 194-94.000.
Verkinderen, Paul August: *See—*
De Geest, Wilfried Florent; Verkinderen, Paul August; and De Smedt, Felix Frederik, 3,709,964.
Vieman, John M.: *See—*
McGough, Gregory J., 3,709,312.
Villiers-Fisher, John F., to Chemical Construction Corporation. Removal of SO_2 from gas streams. 3,709,977, Cl. 423-244.000.
Viste, Kenneth L.: *See—*
McNulty, Patrick J.; Swithenbank, Colin; Viste, Kenneth L.; and von Meyer, William C., 3,709,897.
Vladik, Liboslav, to Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H. Holding device for semiconductor wafers. 3,708,851, Cl. 29-203.000.
Voege, Robert D.: *See—*
Cronkhite, Paul W.; Voege, Robert D.; and Poletti, Joseph W., 3,708,921.
Voglesonger, Harry M., to Dynamics Corporation of America. Motor brush assembly. 3,710,160, Cl. 310-247.000.
Voland, Elmo W.: *See—*
Linn, Wallace L.; and Voland, Elmo W., 3,710,043.
Volker, Ulrich; Fabian, Hein; and Mertl, Klaus. Method for producing friction discs. 3,710,071, Cl. 219-93.000.
Volkov, Viktor Nikolaevich: *See—*
Raichuk, Jury Isaakovich; Knyazhinsky, Zakhar Osipovich; Mandelberg, Simon Lvovich; Lebedev, Vladimir Konstantinovich; and Volkov, Viktor Nikolaevich, 3,710,066.
Volkswagenwerk AKT: *See—*
Spengler, Erich; Boning, Horst; and Requardt, Heiko, 3,709,609.
Volkswagenwerk Aktiengesellschaft: *See—*
Guthmann, Herbert, 3,709,336.
Volmerange, Hubert Marie, to RCA Corporation. Flip-flop and hold phase detector. 3,710,140, Cl. 328-133.000.
Volokhonsky, Lev Avramovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Geo~gy Alexandrovich, 3,709,283.
Von Gottberg, Horst; Schaefer, Gerd; and Joerns, Guenter, to Ransburg GmbH. Coating apparatus. 3,709,190, Cl. 118-2.000.
von Meyer, William C.: *See—*
McNulty, Patrick J.; Swithenbank, Colin; Viste, Kenneth L.; and von Meyer, William C., 3,709,897.
Von Schmeling, Bogislav; Harrison, William A.; and Kulka, Marshall, to United States Rubber Company. Fungicidal use of certain carboxamidothiazoles. 3,709,992, Cl. 424-270.000.
Voronin, Georgy Alexandrovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Sidorenko, Mikhail Nikolaevich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovih; Altgauzen, Andrei Pavlovich; Nikolsky, Leonid Evgenievich; Gorynina, Zoya Alexandrovna; Safronova, Ljudmila Andreevna; Katsevich, Leonid Savvich; Volokhonsky, Lev Avramovich; Nikulin, Alexandr Alexandrovich; Artemiev, Vladimir Dmitrievich; Edemsky, Vladmir Mikhailovich; and Voronin, Georgy Alexandrovich, 3,709,283.
Vydrin, Vladimir Nikolaevich; and Ageev, Leonid Matveevich. Method of rolling metal sheet articles between the driven rolls of the roll mill. 3,709,017, Cl. 72-205.000.

W & T Avery Limited: *See—*
Cooke, Geoffrey Cyril; and Gamble, John Anthony, 3,709,310.
Wacom Ltd.: *See—*
Kusuhara, Masaki, 3,709,656.
Kusuhara, Masaki, 3,710,656.
Wake, John A., to Cincinnati Milacron-Heald Corporation. Machine tool. 3,709,621, Cl. 408-11.000.
Wald Manufacturing Company, Inc.: *See—*
Pawsat, Carlton P., 3,709,059.
Walden, Noel Harry Fred, to Laser Electronics Pty., Ltd. Navigation lights. 3,710,098, Cl. 240-49.000.
Walker, Bruce H., to General Electric Company. High performance folded objective lens. 3,709,582, Cl. 350-202.000.
Walker, Jerry Lee; and Boothe, Jerry Emile, to Calgon Corporation. Control of alluvial and other deposits in aqueous systems. 3,709,816, Cl. 210-58.000.
Walker, Wendell R. Compact and storable exercising apparatus. 3,709,487, Cl. 272-58.000.
Wallace Expanding Machines, Inc.: *See—*
Roper, Ralph E., 3,709,162.
Wallace, Thomas J.: *See—*
Nixon, James; Wallace, Thomas J.; and Beerbower, Alan, 3,709,747.
Wallberg, Erik Arne: *See—*
Lilja, Lars Edvin; and Wallberg, Erik Arne, 3,709,232.
Waller, Duncan E., to Dentsply International Inc. Photopolymerizable dental products. 3,709,866, Cl. 260-27.00r.
Walmet, Gunnar E.: *See—*
Staub, Fred W.; Corman, James C.; and Walmet, Gunnar E., 3,710,295.
Walsh, George M.: *See—*
Moss, George J., Jr.; and Walsh, George M., 3,710,310.
Walsh, Thomas F.: *See—*
Torok, Andrew; and Walsh, Thomas F., 3,709,709.
Walsh, William Kershaw; and Rutherford, Henry Ames, to Research Corporation. Method for decreasing the flammability of cellulosic fabrics. 3,709,658, Cl. 8-129.000.
Walstrom, Leslie R., to Ideavelopment, Inc. Tamper resistant fastening apparatus. 3,709,401, Cl. 220-55.00c.
Walters, Andrew W.: *See—*
Hinchman, Walter R.; Adrian, Donald J.; and Walters, Andrew W., 3,710,387.
Walters, Glenn A. Scaled scan control system for conformal arrays. 3,710,330, Cl. 343-100.0sa.
Walters, Herbert J. Combination corner lock and hanger. 3,709,533, Cl. 287-189.36h.
Wang, Chih-Chung: *See—*
Corrigan, Donald A.; Servi, Italo S.; and Wang, Chih-Chung, 3,709,722.
Wang, Hagbarth: *See—*
Bergem, Norman; Blindheim, Ulf; Onsager, Olav-Torgeir; and Wang, Hagbarth, 3,709,953.
Ward, Charles E.: *See—*
Rowley, David S.; and Ward, Charles E., 3,709,308.
Ward, Frederick Gifford: *See—*
Jennings, Kingsley Jeffrey; and Ward, Frederick Gifford, 3,709,383.
Ward, Richard, to Dobson Park Industries Limited. Fluorescent lamp circuit driven initially at lower voltage and higher frequency. 3,710,177, Cl. 315-106.000.
Warner & Swasey Company, The: *See—*
Paepke, Horst, 3,709,004.
Warner, Glenn H., to Union Carbide Corporation. Preparation of n-alkylmorpholines from diethylene glycol and alkylamines. 3,709,881, Cl. 260-247.000.
Warner, Joseph W.; and Warner, Richard J. Locking electric plug. 3,710,304, Cl. 339-74.00r.
Warner, Richard J.: *See—*
Warner, Joseph W.; and Warner, Richard J., 3,710,304.
Warner, William D.: *See—*
Beuk, Jack F.; and Warner, William D., 3,709,790.
Warren, Gary J.; and Babcock, Gordon L., to Radiation and Environmental Materials, Inc. Atmospheric monitor by means of chemiluminescent reaction. 3,710,107, Cl. 250-71.50r.
Warring, Stig Erik: *See—*
Andersson, Tage Vilhelm Leander; Isheden, Lars Rune; Johansson, Bo Emil; and Warring, Stig Erik, 3,710,372.
Washburn, Oliver K.; and Washburn, Robert M., to Washburn, W. O., & Sons, Inc. Travel cases. 3,709,235, Cl. 132-80.00r.
Washburn, Robert M.: *See—*
Washburn, Oliver K.; and Washburn, Robert M., 3,709,235.
Washburn, W. O., & Sons, Inc.: *See—*
Washburn, Oliver K.; and Washburn, Robert M., 3,709,235.
Watanabe, Masayuki: *See—*
Watanabe, Ryuji; and Watanabe, Masayuki, 3,709,723.
Watanabe, Ryuji; and Watanabe, Masayuki, to Tokyo Shibaura Electric Co., Ltd. Inorganic refractory liquid composition. 3,709,723, Cl. 117-124.00a.
Watanabe, Seizi; Ozaki, Kozo; Oishi, Hiroshi; Aoki, Fumio; and Kawano, Shigeru, to Matsushita Communication Industrial Co., Ltd. and Tokyo Electric Power Co., The. Signal discriminating system. 3,710,373, Cl. 340-310.000.
Watson, Donald W., to Xerox Corporation. Article processing apparatus with feeder shuttle disconnect. 3,709,756, Cl. 156-364.000.
Watson Leavenworth Kelton & Taggart, mesne: *See—*
Sansone, Ronald P., 3,709,117.
Watson, William R.; and Moran, James J., to Nalco Chemical Company. Probe for a conductivity testing device. 3,710,237, Cl. 324-30.00r.
Watts, John F.; Lang, John M.; Simonson, Alden D.; and Nomura, Raymond S., to Boeing Company, The. Cargo loading system for aircraft. 3,709,450, Cl. 244-118.000.
Weather-Rite, Inc.: *See—*
Weatherston, Richard N., 3,709,289.
Weatherhead Company, The: *See—*
Patel, Hiralal V., 3,708,864.
Weatherston, Richard N., to Weather-Rite, Inc. Heating and cooling control system. 3,709,289, Cl. 165-12.000.
Webb, Alan David. Electric power generator. 3,709,739, Cl. 136-208.000.
Webb, James R.; and Webb, Richard C., to Colorado Instruments, Inc. Variable capacitor. 3,710,209, Cl. 317-249.00r.
Webb, Richard C.: *See—*
Webb, James R.; and Webb, Richard C., 3,710,209.
Weber, Ronald A.: *See—*
Hanes, James W. E.; Rimmer, Michael J.; Weber, Ronald A.; and Hintzen, Walter J., 3,709,291.
Wedco, Inc.: *See—*
Feder, Friedhelm R., 3,709,562.
Wegner, Gerhard: *See—*
Fischer, Erhard; and Wegner, Gerhard, 3,709,860.
Wehr, Charles H.: *See—*
Krekeler, Jerome H.; Wehr, Charles H.; and Aboutboul, Henri A., 3,709,664.
Weigele, Manfred: *See—*
Leimgruber, Willy; and Weigele, Manfred, 3,709,922.
Weimer, Charles L.: *See—*
Shannon, Bill M.; and Weimer, Charles L., 3,710,302.
Weimer, Charles L., to Westinghouse Electric Corporation. Bus duct with improved means for connecting housing structures. 3,710,301, Cl. 339-22.00b.
Weiner, Jerold S.: *See—*
Green, George D.; and Weiner, Jerold S., 3,708,947.
Weinert, Volker: *See—*
Zahn, Wolfgang; Friedrich, Gunther; and Weinert, Volker, 3,709,613.
Weise, Irvin B., to Anderson, Greenwood & Co. Pressure responsive valve. 3,709,258, Cl. 137-627.500.
Weisenburger, Lawrence P., to Aries Electronics, Inc., mesne. Low profile socket for integrated circuit pack. 3,710,299, Cl. 339-17.0cf.
Weisselberg, Edward B., to Wyssmont Company, Inc. Rotary air lock apparatus. 3,708,890, Cl. 34-242.000.
Weldes, Helmut H., to Philadelphia Quartz Company. Spray dried detergents containing sodium-potassium double. 3,709,837, Cl. 252-527.000.
Weldum Tool and Engineering Co.: *See—*
Varga, John F., 3,709,419.
Wellcome Foundation, Ltd., The: *See—*
Barrett, Paul Anthony, 3,709,935.
Welling, Leo Johannes Maria, to U.S. Philips Corporation. Supervising device for the supervision of a pulse series. 3,710,366, Cl. 340-248.00p.
Wells, Robert R., to Northrop Corporation. Thin film diffusion brazing of nickel and nickel base alloys. 3,708,866, Cl. 29-498.000.
Wells, Victor S.; and Clark, Hal J. Lifter for vehicles. 3,709,330, Cl. 187-8.720.
Welmut, Weber; Weyer, Rudi; Aumuller, Walter; Muth, Karl; and Stach, Kurt, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Benzenesulfonyl ureas having hypoglycemic activity. 3,709,908, Cl. 260-326.110.
Welt, Martin A., to Radiation Technology, Inc. Process for polymerizing impregnated monomer and material prepared thereby. 3,709,719, Cl. 117-93.310.
Werner, Alan J., to Sybron Corporation. Amplifier system. 3,710,139, Cl. 307-229.000.
Werner, Fred W.: *See—*
Buhayar, Eric S.; Hazard, James E.; Jaagus, John J.; Werner, Fred W.; Wheeler, Robert W.; and Crowe, Robert C., 3,709,349.
Werner, Gerald L. Liquid level indicator. 3,709,038, Cl. 73-313.000.
Werner, Kurt: *See—*
Hess, Karl Gunter; and Werner, Kurt, 3,709,133.
Westinghouse Air Brake Company: *See—*
Jeffrey, William B.; and Frill, Richard K., 3,709,564.
Westinghouse Canada Limited: *See—*
Bates, Kenneth T.; and Hoare, Michael R., 3,709,999.
Wright, Donald F., 3,710,157.
Westinghouse Electric Corporation: *See—*
Baker, Donal E., 3,710,231.
Buck, Daniel C., 3,710,280.
Clay, Joe D.; and Keever, Joseph M., 3,710,245.
Grunert, Kurt A., 3,710,288.
Guillen, Francisco J.; and Campanella, Matthew J., 3,710,377.
Hagberg, John E., 3,710,189.
Hoff, Wallace J., 3,710,083.
Hopkins, Richard H.; Roland, George W.; Partlow, William D.; and Steinbruegge, Kenneth B., 3,710,278.
Hurwitz, Michael J., 3,709,029.
Jessee, Ralph D., 3,710,229.
Justice, James W. H., 3,710,014.
Kuhn, Edmund W., 3,710,059.

Lazor, George, 3,710,293.
Martincic, Paul W.; and Miller, James R., 3,708,875.
O'Keeffe, Terence W.; and Malmberg, Paul R., 3,710,101.
Perry, Robert H., 3,710,100.
Shannon, Bill M.; and Weimer, Charles L., 3,710,302.
Shoupp, William E.; and Bratkowski, Walter V., 3,709,118.
Smith, Andrew W., Jr., 3,709,008.
Swanson, John G., 3,710,205.
Van Nice, Robert I., 3,710,292.
Weimer, Charles L., 3,710,301.

Westinghouse Electric Corporation, mesne: *See—*
Gustafson, Hilding B.; and Frazer, Howard W., 3,709,818.
Olds, Richard G.; and Bonzack, Eugene P., 3,710,197.
Zammit, Frank X.; and Schad, Anthony G., 3,710,194.

Westman, Erik: *See—*
Landa, Torstein; Syvakari, Pertti; and Westman, Erik, 3,709,014.

Weston Instruments, Inc.: *See—*
Kelly, Austin T., 3,710,374.

Wetherell, Thomas J., to High Energy Processing Corporation. Method of making a battery separator from a web of non-woven polymeric fibers. 3,709,738, Cl. 136-148.000.

Wetzler, Justin J., to Means, F. W., Company. Processing of discrete articles without joining same. 3,709,659, Cl. 8-137.000.

Weyer, Rudi: *See—*
Welmut, Weber; Weyer, Rudi; Aumuller, Walter; Muth, Karl; and Stach, Kurt, 3,709,908.

Whalen, George J.; and Graf, Rudolf F. Portable security alarm and alarm system. 3,710,371, Cl. 340-283.000.

Wheelabrator Corporation, The: *See—*
Fogle, James W., 3,708,926.

Wheeler, Robert W.: *See—*
Buhayar, Eric S.; Hazard, James E.; Jaagus, John J.; Werner, Fred W.; Wheeler, Robert W.; and Crowe, Robert C., 3,709,349.

Whipple, Jack C., Jr.: *See—*
Christopher, William H., Jr.; Meyers, Charles O.; and Whipple, Jack C., Jr., 3,708,960.

Whitbread, John Edgar; and Attwell, Ronald Leslie, to British Railways Board. Slip-form paving machines. 3,709,116, Cl. 94-46.0ac.

White, Danny V.: *See—*
Klemm, Le Roy H.; Johnson, Wayne O.; and White, Danny V., 3,709,894.
Klemm, Le Roy H.; Johnson, Wayne O.; and White, Danny V., 3,709,994.

White, Dwain M.; and Hobbs, Stanley Y., to General Electric Company. Method for extruding polyacetylenes to produce high strength graphite precursors. 3,709,863, Cl. 260-30.200.

Whitehead & Kales Company: *See—*
Peisner, Israel D.; Deshetler, Louis K.; and Augustine, Paul C., 3,709,154.

Whiteside, Grady O.; and De Priest, Thomas Y. Apparatus for removing couplings from tubular goods. 3,708,855, Cl. 29-237.000.

Whitney, Wiley. Call forwarding arrangement for telephone systems. 3,710,033, Cl. 179-18.0be.

Wick, Mary Irene. Eyeglasses having readily removable lenses. 3,709,587, Cl. 351-106.000.

Wickersham, Arthur F.: *See—*
Johnson, David A.; and Wickersham, Arthur F., 3,710,178.

Widdowson, Albert Henry; and Savage, Sidney Clifford, to Wildt Mellor Bromley Limited. Pattern control mechanisms for knitting machine. 3,709,003, Cl. 66-50.00r.

Widham, Ernest G. Mail delivery signal device. 3,709,189, Cl. 116-132.000.

Wieme, Andre, to N.V. Bekaert S.A. Switch device for fluidic logical circuit. 3,709,243, Cl. 137-81.500.

Wieting, Eugen; and Siepmann, Hans, to Banning, J., Aktiengesellschaft. Ring rolling apparatus with four rolls. 3,709,011, Cl. 72-10.000.

Wiggins, Leslie Frederick: *See—*
Gittos, Maurice Ward; James, John William; and Wiggins, Leslie Frederick, 3,709,996.

Wikman, Andrew O.: *See—*
Baker, Ralph W.; McCarthy, John H.; Place, Harold G.; and Wikman, Andrew O., 3,709,950.

Wilcox, Burdsal G., to Safeway Stores, Incorporated. Method and apparatus for detection of leaks in seals of packages. 3,708,949, Cl. 53-53.000.

Wildbolz, Rudolf: *See—*
Binder, Rolf; Grundler, Christof; and Wildbolz, Rudolf, 3,709,406.

Wilder, Gene R., to Monsanto Company. N-Tert-alkylamino pyrrolidinylthiocarbonyl sulfides. 3,709,905, Cl. 260-326.830.

Wildt Mellor Bromley Limited: *See—*
Widdowson, Albert Henry; and Savage, Sidney Clifford, 3,709,003.

Wiley, John P., to International Business Machines Corporation. Photographic line tracing apparatus. 3,709,125, Cl. 95-12.000.

Wilke, Howard C.; and Williams, Romaine A., to Anderson Bros. Mfg. Co. Packaging machine with cutting mechanism. 3,708,954, Cl. 53-329.000.

Will, Eugen, to Minnesota Mining and Manufacturing Company. Marking apparatus. 3,709,191, Cl. 118-8.000.

Williams, Charles Edington, to General Electric Company, Limited, The. Circuit arrangements for operating electric discharge lamps. 3,710,184, Cl. 315-227.000.

Williams, Frederick G., Jr.: *See—*
Carleton, Joseph G.; McEwen, Cassius R.; and Williams, Frederick G., Jr., 3,708,948.

Williams, Garold H. Liquid heater and storage means. 3,709,198, Cl. 122-14.000.

Williams, Paul M. Medicated feed supplement for treating cattle. 3,709,987, Cl. 424-128.000.

Williams, Richard H.: *See—*
Schaefer, Robert H.; and Williams, Richard H., 3,709,064.

Williams, Roger B., Jr.; Loshbough, Richard C.; and Deitemeyer, Stanley A., to Reliance Electric Company. Electronic weighing system with digital readout. 3,709,309, Cl. 177-165.000.

Williams, Romaine A.: *See—*
Wilke, Howard C.; and Williams, Romaine A., 3,708,954.

Williamson, Alfred, Limited: *See—*
Williamson, Frank Miles, 3,709,145.

Williamson, David T. N.; Moffat, James; and Wood, William, to Molins Machine Company, Limited. Loading units for machine tools. 3,709,384, Cl. 214-16.40r.

Williamson, Frank Miles, to Williamson, Alfred, Limited. Ticket issuing and like machines. 3,709,145, Cl. 101-66.000.

Williamson, Robert T.; and Georgopoulos, Christos J., to Raytheon Company. Switching circuitry for semiconductor diodes. 3,710,145, Cl. 307-270.000.

Williamson, T. D., Inc.: *See—*
Bates, Marcus L., 3,709,250.

Wilson, Harold W., to Golden Cycle Corporation. Process for the recovery noble metals. 3,709,681, Cl. 75-109.000.

Wilson, Stanley D.; and Harris, Richard K. Means for determining the shear strength of earth in situ. 3,709,031, Cl. 73-101.000.

Wilson, Warren F.: *See—*
Quilici, Alfred P.; and Wilson, Warren F., 3,710,370.

Wimmer, Theodor: *See—*
Hrach, Josef; and Wimmer, Theodor, 3,709,859.

Winckhofer, Charles: *See—*
Lofquist, Robert Alden; Crescentini, Lamberto; and Winckhofer, Charles, 3,709,865.

Windle, Tom J., to Phillips Petroleum Company. Apparatus for testing conduit. 3,709,260, Cl. 138-90.000.

Windmoller & Holscher: *See—*
Upmeier, Hartmut, 3,709,290.

Winston, Emanuel A. Bubble producing toy. 3,708,909, Cl. 46-7.

Wirth, Dennis L.: *See—*
Marco, Alex A.; and Wirth, Dennis L., 3,709,187.

Wirtz, Edward A.: *See—*
Peterson, Wayne A.; and Wirtz, Edward A., 3,709,100.

Wisotzky, Reuben; and Petersen, Richard E., to Pandel-Bradford, Inc. Method of making suede-like plastic. 3,709,752, Cl. 156-79.000.

Witco Chemical Corporation: *See—*
Mausner, Marvin L.; and Dater, Arnold H., 3,709,838.

Witting, Harald L., to General Electric Company. Composite thermionic cathodes for gas discharge devices. 3,710,172, Cl. 313-338.000.

Wlodyka, Edwin W., to Highland Laboratories. Tide indicating timepiece. 3,708,971, Cl. 58-3.000.

Wochner, Fred Joseph, to Dennison Manufacturing Company. Multistation labelling method. 3,709,755, Cl. 156-235.000.

Wolf, Sylvan: *See—*
Costley, Vivian G.; and Wolf, Sylvan, 3,709,148.

Wolfelsperger, Robert O.: *See—*
Johnson, Harry Joseph; Wolfelsperger, Robert O.; and Davis, Robert Edgar, 3,709,114.

Wolfrum, Gerhard, to Farbenfabriken Bayer Aktiengesellschaft. Disazo dyestuffs. 3,709,870, Cl. 260-186.000.

Wolter, Donald R. Firearm sealing device. 3,708,901, Cl. 42-1.00n.

Wong, Chak-Kuen: *See—*
Frazer, William D.; and Wong, Chak-Kuen, 3,710,346.

Wood, Barry B.: *See—*
Chase, David O.; Maloney, Martin V.; Wood, Frederick J., Jr.; and Wood, Barry B., 3,708,821.

Wood, Frederick J., Jr.: *See—*
Chase, David O.; Maloney, Martin V.; Wood, Frederick J., Jr.; and Wood, Barry B., 3,708,821.

Wood, Jack: *See—*
Boyce, Clive B. C.; Barker, Michael D.; and Wood, Jack, 3,709,902.

Wood, Jerry L.: *See—*
Browning, William C.; Chesser, Billy G.; and Wood, Jerry L., 3,709,819.

Wood, Lawrence M., to Eastman Kodak Company. Shutter control mechanism. 3,709,113, Cl. 95-10.0ct.

Wood, Robert J. Door check and door stop combination. 3,708,825, Cl. 16-49.000.

Wood, Russell E., to Carrier Corporation. Control for air conditioning apparatus. 3,709,769, Cl. 161-22.000.

Wood, William: *See—*
Williamson, David T. N.; Moffat, James; and Wood, William, 3,709,384.

Wooden, John A., to Brookside Corporation. Reinforced plastic fan hub. 3,709,633, Cl. 416-134.000.

Worner, Otto, to Daimler-Benz Aktiengesellschaft. Method for fastening the blades of a rotor for hydrodynamic units. 3,708,846, Cl. 29-156.8cf.

Wossner, Felix, to Fichtel & Sachs AG. Apparatus for levelling a vehicle chassis. 3,709,517, Cl. 280-104.000.

Wright, Allen C., to Haws Drinking Faucet Company. Valve assembly for water fountains and the like. 3,709,254, Cl. 137-609.000.

Wright, Charles S., to Delta Electronics Inc. Solid state receiving multicoupler. 3,710,260, Cl. 325-308.000.

Wright, Donald F., to Westinghouse Canada Limited. Method of monitoring airport runway end identification lamps. 3,710,157, Cl. 307-131.000.

Wright, Hershel Earl. Method and device for producing foam. 3,709,437, Cl. 239-343.000.

Wright, Robert J.; Chapin, John S.; Mah, George; and Karstendiek, Claude A., to Dow Chemical Company, The. Sputter deposition of refractory carbide on metal working tools. 3,709,809, Cl. 204-192.000.

Wuertele, Lothar: *See—*
Eckert, Guenter; Hartmann, Heinrich; Marx, Matthias; and Wuertele, Lothar, 3,709,724.

Wurker, Carl H. Film splicer. 3,709,079, Cl. 83-375.000.

Wurm, Jaroslav. Pressure translating apparatus and process. 3,708,996, Cl. 62-116.000.

Wyatt, James B.: *See—*
Stephenson, Charles F.; Van Dyck, Kenneth A.; and Wyatt, James B., 3,708,879.

Wyle Laboratories: *See—*
Payne, Peter R., 3,709,179.

Wyman, Dennis G.; and Bichell, William J., to Granta Corporation. Message device. 3,709,502, Cl. 273-161.000.

Wyssmont Company, Inc.: *See—*
Weisselberg, Edward B., 3,708,890.

Xenon Corporation: *See—*
Dewey, C Forbes, Jr., 3,710,277.

Xerox Corporation: *See—*
Acquavia, Thomas J., Jr., 3,709,485.
Baker, Arthur R.; Brant, William; and Danielson, Clarence J., 3,709,492.
Ciuffini, Anthony J.; and Galen, Joseph J., 3,709,683.
Turner, Lyman H.; Kukucka, William P.; and Summers, James E., 3,709,595.
Turner, Lynn H., 3,709,713.
Watson, Donald W., 3,709,756.

Yabe, Masaya; Takahama, Teizo; Kono, Masaru; and Hirono, Katsumi, to Fuji Denki Seizo Kabushiki Kaisha. Semiconductor oscillating element and control circuit therefor. 3,710,208, Cl. 317-235.000.

Yamada, Isao: *See—*
Sawada, Hideo; Rin, Ensei; Yamada, Isao; Mano, Hiroshi; and McGourty, Thomas K., 3,710,359.

Yamaguchi, Ken: *See—*
Tanaka, Katsunobu; Suzuki, Takeo; Yamaguchi, Ken; and Yamamoto, Masaki, 3,709,783.

Yamamoto, Akira: *See—*
Fujimoto, Tadasu; Kuroda, Kotofusa; and Yamamoto, Akira, 3,709,737.

Yamamoto, Keisuke; and Fujimori, Toshimitsu, to Matshshita Electric Industrial Co., Ltd. Atuomatic frequency control. 3,710,273, Cl. 331-1.00a.

Yamamoto, Masaki: *See—*
Tanaka, Katsunobu; Suzuki, Takeo; Yamaguchi, Ken; and Yamamoto, Masaki, 3,709,783.

Yamanoi, Akio: *See—*
Otsuka, Shinichiro; Honda, Takeshi; and Yamanoi, Akio, 3,709,785.

Yang, Yue-Chyou. Demountable garage building. 3,708,933, Cl. 52-236.000.

Yapoudjian, Claude; and Henelle, Max, to Compagnie Industrielle des Telecommunications. Equipment housing for submarine suspension. 3,708,812, Cl. 9-8.00r.

Yard, John S., to Fischer & Porter Co. Fluid-powered flowmeter for measuring low flow rates. 3,709,213, Cl. 128-2.980.

Yasuno, Akio: *See—*
Tanaka, Ryuji; and Yasuno, Akio, 3,709,912.

Yeomans, Robert P.: *See—*
Foster, Norman B.; Yeomans, Robert P.; and Daniels, Robert S., 3,708,902.

Yissum Research Development Company of the Hebrew University of Jerusalem: *See—*
Gross, Jack; and Gordon, Amirav, 3,710,117.

Yokogawa Electric Works, Ltd.: *See—*
Neu, Kazuo; and Tochitani, Yutaka, 3,710,326.
Ohata, Shuichi; Takeuchi, Yoji; and Ishiguro, Takeshi, 3,710,089.

Yokoyama, Hideo, to Sony Corporation. Signal gating circuit. 3,710,142, Cl. 307-242.000.

Yoon, Moo S.: *See—*
Niesen, George P.; and Yoon, Moo S., 3,709,604.

Yoshida, Akira: *See—*
Oda, Nakaaki; Morioka, Nagaharu; Makino, Yoshio; and Yoshida, Akira, 3,709,824.

Yoshida, Norio; Tomita, Kuniyuki; and Iizuka, Yoshio, to Sankyo Company Limited. 2-Alkyl-4,5-diphenylpyrrole derivatives. 3,709,906, Cl. 260-326.50m.

Yoshidomi Pharmaceutical Industries: *See—*
Goya, Yoshihito; Nakanishi, Michio; Sawatari, Kenichi; Hirose, Akira; and Shinozawa, Tetsuichi, 3,709,674.

Yoshimura, Susumu; Asakawa, Shirow; and Hasegawa, Katsue. Solid electrolyte. 3,709,820, Cl. 252-62.200.

Yoshimura, Susumu. Organic solid electrolyte. 3,709,821, Cl. 252-62.200.

Yoshitake, Norito; and Imazeki, Ryoji, to Fujitsu Limited. System for diagnosing an input-output control unit. 3,710,350, Cl. 340-172.500.

Youden, David H., to Heald Machine Company, The. Machine tool. 3,708,923, Cl. 51-165.930.

Young, Christopher John: *See—*
Desty, Denis Henry; and Young, Christopher John, 3,709,654.

Young, James B., Jr.: *See—*
Cohen, John B.; Janson, Paul E.; Mc Farland, Harold L., Jr.; and Young, James B., Jr., 3,710,324.

Yuasa Battery Company Limited: *See—*
Fujimoto, Tadasu; Kuroda, Kotofusa; and Yamamoto, Akira, 3,709,737.

Yuda, Minoru: *See—*
Abe, Takuzi; and Yuda, Minoru, 3,710,017.

Zadow, Hanni; and Zadow, Herbert. Free foil flow control device. 3,709,244, Cl. 137-106.000.

Zadow, Herbert: *See—*
Zadow, Hanni; and Zadow, Herbert, 3,709,244.

Zafira France: *See—*
Moransais, Charles, 3,709,071.

Zaharis, Edmond P. Fishing line diving device. 3,708,904, Cl. 43-43.130.

Zahn, Wolfgang; Findeis, Gunter; and Muller, Dieter, to Agfa-Gevaert Aktiengesellschaft. Method and apparatus for the production of color prints. 3,709,601, Cl. 355-38.000.

Zahn, Wolfgang; Friedrich, Gunther; and Weinert, Volker, to Agfa-Gevaert Aktiengesellschaft. Method and apparatus for determining printing time of negatives. 3,709,613, Cl. 356-202.000.

Zammit, Frank X.; and Schad, Anthony G., to Westinghouse Electric Corporation, mesne. Concealed adjustable element for electronic circuit cards. 3,710,194, Cl. 317-101.00r.

Zarnowiecki, Krzysztof: *See—*
Zielczynski, Mieczyslaw; and Zarnowiecki, Krzysztof, 3,710,116.

Zaruba, Wenzel; and Sehnal, Jan, to Textol Systems, Inc. Linear actuator system with reversing means. 3,709,047, Cl. 74-25.00.

Zbrojovka Brno, narodni podnik: *See—*
Hyca, Bohumil, 3,709,759.

Zbrojovka Brono, narodni podnik: *See—*
Hyca, Bohumil, 3,709,760.

Zeiger, Kenneth K., to Inter-Computer Electronics, Inc. Sample and hold circuit. 3,710,141, Cl. 307-235.000.

Zemke, Frederick A.: *See—*
Looker, Olin L.; Zemke, Frederick A.; Knicely, David R.; Rouse, Russell V.; and Slates, Larry L., 3,709,231.

Zemtsov, Jury Semenovich: *See—*
Isaev, Alexei Ilich; Pevzner, Semen Albertovich; and Zemtsov, Jury Semenovich, 3,708,919.

Zepell, Nathan A. Writing implement with retractable writing tip enclosure. 3,709,619, Cl. 401-108.000.

Zergenyi, Janos: *See—*
Habicht, Ernst; Libis, Bernard; and Zergenyi, Janos, 3,709,909.

Ziegler, Carl; and Sprague, James M., to Merck & Co., Inc. N-Acyl and n-organosulfonyl mono-or di-substituted sulfamoylbenzenesulfonamides. 3,709,917, Cl. 260-347.200.

Zielczynski, Mieczyslaw; and Zarnowiecki, Krzysztof. Dosimeter for penetrating ionizing radiation of any composition and spectrum. 3,710,116, Cl. 250-83.60r.

Ziemelis, Andris Eduardovich: *See—*
Abramov, Viktor Petrovich; Junga, Yan Petrovich; Berzin, Gunard Valdemarovich; Skrupsky, Voldemar Petrovich; Frolov, Petr Nikolaevich; Lugovskoi, Andrei Lukyanovich; Shilgorin, Felix Alexandrovich; Dalbinsh, Yan Yanovich; Rotsen, Karl Arturovich; Ziemelis,Andris Eduardovich; Elksnis, Artur Yanovich; and Priede, Bruno Andreevich, 3,709,270.

Zimmerman, Abraham A.; Furlong, Louis E.; and Vadekar, Mohan, to Esso Research and Engineering Company. Gasoline composition providing enhanced engine operation. 3,709,668, Cl. 44-72.000.

Zirkle, Charles L.: *See—*
Lafferty, John J.; and Zirkle, Charles L., 3,709,913.

Zmoda, Barney Joseph: *See—*
Chirash, William; and Zmoda, Barney Joseph, 3,709,825.

Zocco, Natale C.; and Cohen, Stanley I., to Olin Corporation. Polyurethane foams having increased density. 3,709,843, Cl. 260-2.5an.

Zoda, Keiichi: *See—*
Shimoda, Keitaro; Tsutsui, Nobuhiro; Zoda, Keiichi; and Ueki, Masayuki, 3,709,971.

Zoecon Corporation: *See—*
Siddall, John B., 3,709,914.
Siddall, John B., 3,709,915.

Zwagemakers, Johannes: *See—*
Van Dijk, Jan; Zwagemakers, Johannes; and Van Houtenlaan, Maria Antonius, 3,709,911.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF JANUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AMP Inc.: *See*—
Kinkaird, Robert J. Re. 27,540.
Bramley, Anthony, and J. F. Gilbert; said Gilbert assignor to said Bramley. Production of netting. Re. 27,544, 1–9–73, Cl. 161—57.
Gilbert, John F.: *See*—
Bramley, Anthony, and Gilbert. Re. 27,544.
Guy, William R., to Kelvinator, Inc. Range open door latching device. Re. 27,545, 1–9–73, Cl. 219—412.
Hocq, Robert R., to Societe Franco-Hispano-Americaine Francispam. Concealed hinges. Re. 27,546, 1–9–73, Cl. 16—164.
Kelvinator, Inc.: *See*—
Guy, William R. Re. 27,545.
Kinkaird, Robert J., to AMP Inc. Panel connector with flag-type terminals. Re. 27,540, 1–9–73, Cl. 339—176.
Kitchel, Fred L., to U.S. Steel Corp. Annealing furnace seal. Re. 27,543, 1–9–73, Cl. 263—40.
Morehouse, Edward L., to Union Carbide Corp. Siloxane-oxyalkylene copolymer foam stabilizers. Re. 27,541, 1–9–73, Cl. 260—448.2.
Olivetti, Ing. C., & C., S.p.A.: *See*—
Perucca, Vincenzo. Re. 27,542.
Perucca, Vincenzo, to Ing. C. Olivetti & C., S.p.A. High speed serial printing device for teleprinters, accounting machines and data processing equipment. Re. 27,542, 1–9–73, Cl. 101—93.
Societe Franco-Hispano–Americaine Francispam: *See*—
Hocq, Robert R. Re. 27,546.
Union Carbide Corp.: *See*—
Morehouse, Edward L. Re. 27,541.
U.S. Steel Corp.: *See*—
Kitchel, Fred L. Re. 27,543.

LIST OF PLANT PATENTEES

Coward, Bob C., to Yoder Brothers, Inc. Chrysanthemum plant. 3,288, 1–9–73, Cl. 74.
Driscoll Strawberry Associates, Inc.: *See*—
Johnson, Harold S., Jr. 3,286.
Gentile, Eugene T., W. H. Jessel, Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,289, 1–9–73, Cl. 80.
Hill, E. G., Co., Inc.: *See*—
Jelly, Robert G. 3,287.
Irwin Greenhouses, Inc.: *See*—
Irwin, James T. 3,290.
Irwin, James T., to Irwin Greenhouses, Inc. Kalanchoe plant. 3,290, 1–9–73, Cl. 68.
Jelly, Robert G., to E. G. Hill Co., Inc. Rose plant. 3,287, 1–9–73, Cl. 20.
Jessel, William H., Jr.: *See*—
Gentile, Eugene T., Jessel, Jr., and Duffett. 3,289.
Johnson, Harold S., Jr., to Driscoll Strawberry Associates, Inc. Strawberry plant. 3,286, 1–9–73, Cl. 49.
Yoder Brothers, Inc.: *See*—
Coward, Bob C. 3,288.
Gentile, Eugene T., Jessel, Jr., and Duffett. 3,289.

LIST OF DESIGN PATENTEES

A.E.I. Corp.: *See*—
Zahlman, Charles C. 225,917.
AMP Inc.: *See*—
Kourimsky, Friedrich J. A. 225,857.
Adler, James S.: *See*—
Dolby, John T., and Adler. 225,886.
Dolby, John T., and Adler. 225,887.
Dolby, John T., and Adler. 225,888.
Amerock Corp.: *See*—
Clayton, La Verne E. 225,821.
Tegner, Raymond U. H. 225,820.
Ampex Corp.: *See*—
Staley, Darrell S. 225,863.
Anthony, Fred S., to Oregon Novelties, Inc. Indoor table top tether ball game standard. 225,873, 1–9–73, Cl. D34—5.
Aquila, Joseph M. Hat. 225,793, 1–9–73, Cl. D2—258.
Auslander, Norman L., to Lander Co., Inc. Bottle. 225,833, 1–9–73, Cl. D9—115.
Bachman, Ralph W., and D. R. Humphrey, to Bachman's Inc. Floral display cart. 225,839, 1–9–73, Cl. D14—3.
Bachman's Inc.: *See*—
Bachman, Ralph W., and Humphrey. 225,839.
Ball, Douglas C., to Massey-Ferguson Industries Ltd. File cart. 225,840, 1–9–73, Cl. D14—3.
Bedient, Jack R. Tether ball projector and catcher toy. 225,877, 1–9–73, Cl. D34—15.
Bertazzoli, Guido, to Industrie Pirelli, S.p.A. Tire. 225,914, 1–9–73, Cl. D90—20.
Besser Co.: *See*—
Cruzen, Harry F., Jr. 225,846.
Bessett, Clifford H.: *See*—
Boyd, James W., and Bessett. 225,836.
Bohan, Richard P. Combined television guide holder and program reminder. 225,810, 1–9–73, Cl. D6—184.
Boldt, Melvin H., to G. W. Murphy Industries, Inc. Saber saw. 225,819, 1–9–73, Cl. D8—64.
Boyd, James W., and C. H. Bessett, to Packaging Corp. of America. Packaging tray for eggs or other fragile articles. 225,836, 1–9–73, Cl. D9—190.
Broadley, Eric H., to Lola Cars Ltd. Model racing car. 225,879, 1–9–73, Cl. D34—15.
Brotton, Thomas E. Bottle. 225,831, 1–9–73, Cl. D9—40.
Brown, Gaylor W.: *See*—
Johnson, Robert T., and Brown. 225,835.
Bruce Plastics, Inc.: *See*—
Szabo, Bela G. 225,829.
Brunswick Corp., The: *See*—
Reineman, Richard G. 225,875.
Schaefer, George E. 225,874.
Buhk, Randall P., to Steelcase, Inc. Chair body. 225,843, 1–9–73, Cl. D15—1.
Burke, J. E., Co., The: *See*—
Burke, William J. 225,872.
Burke, William J., to The J. E. Burke Co. Antique car bounce ride. 225,872, 1–9–73, Cl. D34—5.
Chasen, Lee R., to Coats & Clark, Inc. Hinge. 225,823, 1–9–73, Cl. D8—189.
Chasen, Lee R., to Coats & Clark, Inc. Hinge. 225,824, 1–9–73, Cl. D8—189.
Chasen, Lee R., to Coats & Clark, Inc. Hinge. 225,825, 1–9–73, Cl. D8—189.
Chasen, Lee R., to Coats & Clark, Inc. Hinge. 225,826, 1–9–73, Cl. D8—191.
Chasen, Lee R., to Coats & Clark, Inc. Hinge. 225,827, 1–9–73, Cl. D8—191.
Chasen, Lee R., to Coats & Clark, Inc. Hinge. 225,828, 1–9–73, Cl. D8—191.
Clayton, La Verne E., to Amerock Corp. Pull. 225,821, 1–9–73, Cl. D8—166.
Clement, Richard H. Ribbed wheel center. 225,842, 1–9–73, Cl. D14—80.
Cline, Vincent C. Bank book register clip. 225,906, 1–9–73, Cl. D74—2.
Clowe, Robert A.: *See*—
Van Valkinburgh, Robert H., and Clowe. 225,867.
Coastal Dynamics Corp.: *See*—
Krantz, John D. 225,855.
Coats & Clark, Inc.: *See*—
Chasen, Lee R. 225,823.
Chasen, Lee R. 225,824.
Chasen, Lee R. 225,825.
Chasen, Lee R. 225,826.
Chasen, Lee R. 225,827.
Chasen, Lee R. 225,828.
Costa, Allan. Dispenser for small quantities of liquid. 225,845, 1–9–73, Cl. D16—2.
Cowan, Edwin J. Radiant heater. 225,851, 1–9–73, Cl. D23—122.
Cramer, John C., to Dayton Coil Spring Co. Ash tray. 225,909, 1–9–73, Cl. D85—2.
Crannell, Clendon E. Study carrell. 225,871, 1–9–73, Cl. D33—11.
Critcher, John L. Watercraft. 225,904, 1–9–73, Cl. D71—1.
Cruzen, Harry F., Jr., to Besser Co. Block. 225,846, 1–9–73, Cl. D18—2.
Damon Corp.: *See*—
Munn, David E., Mello, and Maddestra. 225,856.
Dayton Coil Spring Co.: *See*—
Cramer, John C. 225,909.
De Carlo, Giancarlo, to J. G. Furniture Co., Inc. Folding chair. 225,795, 1–9–73, Cl. D6—41.

Dickinson, James R. Tool for cleaning battery terminals and connectors. 225,893, 1–9–73, Cl. D49—23.
Di Pierro, Michael J., and D. P. Mastrovito, to Stand Oil Co. Insulated chest. 225,883, 1–9–73, Cl. D44—1.
Dolby, John T., and J. S. Adler, to Standard Oil Co. Dish. 225,886, 1–9–73, Cl. D44—10.
Dolby, John T., and J. S. Adler, to Standard Oil Co. Tray. 225,887, 1–9–73, Cl. D44—10.
Dolby, John T., and J. S. Adler, to Standard Oil Co. Tray. 225,888, 1–9–73, Cl. D44—10.
Doman, Donald W., and L. K. Sauey, to Flambeau Plastics Corp. Stein. 225,885, 1–9–73, Cl. D44—9.
Dunlop Ltd.: *See*—
Wilcox, Brian L. 225,915.
Dunlop Holdings Ltd.: *See*—
Oita, Yoshio. 225,913.
Educational Computer Corp.: *See*—
Slecko, Nicholas A., and Murphy. 225,859.
Electrohome Ltd.: *See*—
McQuarrie, Harvey K., and Tate. 225,899.
Emery, Jean. Combined container and dispenser for powdered materials. 225,894, 1–9–73, Cl. D9—207.
Entwistle, Clive. Table lamp. 225,890, 1–9–73, Cl. D48—20.
Explosives Corp. of America: *See*—
Yates, Patrick A. 225,864.
Fedor, Thomas. Pedestal for furniture. 225,816, 1–9–73, Cl. D6—196.
Fisher, Morris F., to Mohasco Industries, Inc. Chair. 225,800, 1–9–73, Cl. D6—71.
Flambeau Plastics Corp.: *See*—
Doman, Donald W., and Sauey. 225,885.
Flider, Frank S., to The Justrite Mfg. Co. Combined cup and pouring hose attachment for a can or the like. 225,838, 1–9–73, Cl. D9—290.
Fujita, Ryuzo. Combined tape player and radio receiver therefor. 225,866, 1–9–73, Cl. D26—14.
Fulton, James F., and J. A. Rinaldi, to Owens-Corning Fiberglas Corp. Bathroom unit. 225,848, 1–9–73, Cl. D23—49.
Gaylord, Leonard R., to International Valide Corp. Canister for dehumidifying crystals or a similar article. 225,852, 1–9–73, Cl. D23—146.
Gillette Co., The: *See*—
Hill, Robert L. 225,830.
Gray, David T., and C. W. Morck, Jr., to Selas Corp. Industrial burner. 225,854, 1–9–73, Cl. D23—129.
Guillon, Jacques. Sofa. 225,799, 1–9–73, Cl. D6—63.
Hanig, Harvey, and D. P. Mastrovito, to Standard Oil Co. Insulated ice chest or similar article. 225,884, 1–9–73, Cl. D44—1.
Hartill, William. Calked horse shoe. 225,869, 1–9–73, Cl. D30—35.
Hecht, Jay R. Fan. 225,853, 1–9–73, Cl. D23—165.
Helverson, Donald E. Combined desk, seat and storage unit. 225,796, 1–9–73, Cl. D6—43.
Hill, Robert L., to The Gillette Co. Dispensing container. 225,830, 1–9–73, Cl. D9—3.
Hoffman, Louis, to Hold-All Mfg. Co., Inc. Shoe rack. 225,802, 1–9–73, Cl. D6—116.
Hold-All Mfg. Co., Inc.: *See*—
Hoffman, Louis. 225,802.
Honeywell Information Systems, Inc.: *See*—
Kline, George H. 225,858.
Horne, Willard R., and R. P. Vuillemenot, to The Procter & Gamble Co. Jar or similar article. 225,832, 1–9–73, Cl. D9—100.
Humphrey, Dallas R.: *See*—
Bachman, Ralph W., and Humphrey. 225,839.
Hunt-Wesson Foods, Inc.: *See*—
Knies, Robert H. 225,892.
Hyer Hardware Mfg. Co.: *See*—
James, David F. 225,822.
Ikejima, Yoritaka: *See*—
Ono, Taisuke, and Ikejima. 225,918.
Industrie Pirelli, S.p.A.: *See*—
Bertazzoli, Guido. 225,914.
International Valide Corp.: *See*—
Gaylord, Leonard R. 225,852.
Ishii, Hideki, to Kabushiki Kaisha Ricoh. Electronic computer or similar article. 225,862, 1–9–73, Cl. D26—5.
J. G. Furniture Co., Inc.: *See*—
De Carlo, Giancarlo. 225,795.
James, David F., to Hyer Hardware Mfg. Co. Ornamental backing plate for handle as used on doors, drawers, and the like. 225,822, 1–9–73, Cl. D8—179.
Johnson, Robert T., and G. W. Brown, to Koehring Co. Container for flowable materials or the like. 225,835, 1–9–73, Cl. D9—169.
Justrite Mfg. Co., The: *See*—
Flider, Frank S. 225,838.
Kabushiki Kaisha Ricoh: *See*—
Ishii, Hideki. 225,862.
Yagi, Ohiko. 225,901.
Kalvitis, Robert E., to Xerox Corp. Housing for electronic apparatus. 225,860, 1–9–73, Cl. D26—5.
Kalvitis, Robert E., to Xerox Corp. Housing for electronic apparatus. 225,861, 1–9–73, Cl. D26—5.
Kao, Tonis: *See*—
Kramer, Herbert, and Kao. 225,868.
Kline, George H., to Honeywell Information Systems, Inc. Keyboard for a bank teller terminal or the like. 225,858, 1–9–73, Cl. D26—5.
Kneapler, Stephen J., to Richford America Corp. Bottle. 225,834, 1–9–73, Cl. D9—143.
Knies, Robert H., to Hunt-Wesson Foods, Inc. Matchbook cover. 225,892, 1–9–73, Cl. D48—29.
Koehring Co.: *See*—
Johnson, Robert T., and Brown. 225,835.
Kourimsky, Friedrich J. A., to AMP Inc. Electrical connector housing. 225,857, 1–9–73, Cl. D26—1.
Kramer, Herbert, and T. Kao, to Siemens Aktiengesellschaft. Videotelephone transceiver. 225,868, 1–9–73, Cl. D26—14.
Krantz, John D., to Coastal Dynamics Corp. Dental cuspidor. 225,855, 1–9–73, Cl. D24—1.
Kurianski, Stanislau. Hair spray shield or similar article. 225,910, 1–9–73, Cl. D86—10.
Lander Co., Inc.: *See*—
Auslander, Norman L. 225,833.
Lazet, Frank J., to Philadelphia Quartz Co. Translucent nugget of solidified inorganic chemicals. 225,844, 1–9–73, Cl. D16—1.
Lichtman, Philip R. Pistol. 225,847, 1–9–73, Cl. D22—1.
Lincoln, Dale, to Systron-Donner Corp. Cabinet for electronic alarm system. 225,905, 1–9–73, Cl. D72—1.
Lola Cars Ltd.: *See*—
Broadley, Eric H. 225,879.
Long Island Mold and Tool Corp.: *See*—
Vath, William. 225,876.
Machacek, Karel, and D. Marzurova, to Meopta, narodni podnik. Enlarger. 225,902, 1–9–73, Cl. D61—1.
Maddestra, Robert: *See*—
Munn, David E., Mello, and Maddestra. 225,856.
Manderfield, Ellen B., to Oneida, Ltd. Spoon or similar article. 225,896, 1–9–73, Cl. D54—12.
Marlin Toy Products, Inc.: *See*—
Thornell, Ernest L. 225,881.
Thornell, Ernest L. 225,882.
Marzurova, Danuse: *See*—
Machacek, Karel, and Marzurova. 225,902.
Massey-Ferguson Industries Ltd.: *See*—
Ball, Douglas C. 225,840.
Mastrovito, Donald P.: *See*—
Di Pierro, Michael J., and Mastrovito. 225,883.
Hanig, Harvey, and Mastrovito. 225,884.
Matushita Electric Works, Ltd.: *See*—
Ono, Taisuke, and Ikejima. 225,918.
Matzel, George J., and E. W. Schussel, to Stop-Motion Devices Corp. Yarn guard. 225,916, 1–9–73, Cl. D92—15.
McDonald Bernard, to Medical Testing Systems, Inc. Clinical instrument. 225,908, 1–9–73, Cl. D83—12.
McQuarrie, Harvey K., and M. D. Tate, to Electrohome Ltd. Housing for a radio-phonograph or the like. 225,899, 1–9–73, Cl. D56—4.
Medical Testing Systems, Inc.: *See*—
McDonald, Bernard. 225,908.
Mello, Thomas M.: *See*—
Munn, David E., Mello, and Maddestra. 225,856.
Meopta, narodni podnik: *See*—
Machacek, Karel, and Marzurova. 225,902.
Mohasco Industries, Inc.: *See*—
Fisher, Morris F. 225,800.
Moore, James S. Foldable wall shelving unit. 225,803, 1–9–73, Cl. D6—130.
Morck, Charles W., Jr.: *See*—
Gray, David T., and Morck. 225,854.
Morgan, Mary A. Parasol cover. 225,911, 1–9–73, Cl. D88—3.
Morgison, Fred. Rock for small parts. 225,870, 1–9–73, Cl. D33—3.
Munn, David E., T. M. Mello, and R. Maddestra, to Damon Corp. Rotational energy demonstrator. 225,856, 1–9–73, Cl. D25—1.
Murphy, G. W., Industries, Inc.: *See*—
Boldt, Melvin H. 225,819.
Murphy, George W.: *See*—
Slecko, Nicholas A., and Murphy. 225,859.
Nasta Industries Corp.: *See*—
Spiegel, Norman. 225,880.
Ohno, Kiyomitsu. Receiving case for lending shoes. 225,895, 1–9–73, Cl. D53—3.
Oita, Yoshio, to Dunlop Holdings Ltd. Tire. 225,913, 1–9–73, Cl. D90—20.
Olsson, Stig A. V.: *See*—
Sjostedt, Bo A., and Olsson. 225,865.
Oneida Ltd.: *See*—
Manderfield, Ellen B. 225,896.
Richmond, Colin B. II. 225,898.
Ono, Taisuke, and Y. Ikejima, to Matushita Electric Works, Ltd. Combined electric dry shaver, trimmer and cover or similar article. 225,918, 1–9–73, Cl. D95—3.
Oregon Novelties, Inc.: *See*—
Anthony, Fred S. 225,873.
Owens-Corning Fiberglas Corp.: *See*—
Fulton, James F., and Rinaldi. 225,848.
Packaging Corp. of America: *See*—
Boyd, James W., and Bessett. 225,836.
Pallet Development, Inc.: *See*—
Skendrovic, Lawrence. 225,841.
Philadelphia Quartz Co.: *See*—
Lazet, Frank J. 225,844.
Procter & Gamble Co., The: *See*—
Horne, Willard R., and Vuillemenot. 225,832.
Rafshoon, Helen G. Expandable holder for a pair of spectacles. 225,900, 1–9–73, Cl. D57—1.
Reineman, Richard G., to The Brunswick Corp. Console for a bowling scoring device. 225,875, 1–9–73, Cl. D34—5.
Research Technology Inc.: *See*—
Short, Ray L., Jr. 225,903.
Richford America Corp.: *See*—
Kneapler, Stephen J. 225,834.
Richmond, Colin B. II., to Oneida Ltd. Spoon or similar article. 225,898, 1–9–73, Cl. D54—12.
Rinaldi, Joseph A.: *See*—
Fulton, James F., and Rinaldi. 225,848.
Rowenta–Werke GmbH: *See*—
Strzelczyk, Gotz F. 225,891.
Sauey, Lawrence K.: *See*—
Doman, Donald W., and Sauey. 225,885.

Savage, Charles C. Necktie. 225,794, 1–9–73, Cl. D2—851.
Schaefer, George E., to The Brunswick Corp. Pedestal for a bowler identification panel for a bowling scoring device. 225,874, 1–9–73, Cl. D34—5.
Scholes, Eldred S. Pastry filler head. 225,889, 1–9–73, Cl. D44—29.
Schussel, Edward W.: *See*—
Matzel, George J., and Schussel. 225,916.
Sekine, Nobuyoshi. Bicycle. 225,912, 1–9–73, Cl. D90—8.
Selas Corp.: *See*—
Gray, David T., and Morck. 225,854.
Semiproduktion AB: *See*—
Sjostedt, Bo A., and Olsson. 225,865.
Shiu, Desmond K. Massage roller appliance. 225,907, 1–9–73, Cl. D83—1.
Short, Ray L., Jr., to Research Technology Inc. Film inspection machine. 225,903, 1–9–73, Cl. D61—1.
Siecko, Nicholas A., and G. W. Murphy, to Educational Computer Corp. Electronic computer or similar article. 225,859, 1–9–73, Cl. D26—5.
Siemens Aktiengesellschaft: *See*—
Kramer, Herbert and Kao. 225,868.
Sjostedt, Bo A., and S. A. V. Olsson, to Semiproduktion AB. Loud speaker. 225,865, 1–9–73, Cl. D26—14.
Skendrovic, Lawrence, to Pallet Development, Inc. Pallet. 225,841, 1–9–73, Cl. D14—3.
Spiegel, Norman, to Nasta Industries Corp. Toy ferris wheel. 225,880, 1–9–73, Cl. D34—15.
Staley, Darrell S., to Ampex Corp. Magnetic tape video cassette machine. 225,863, 1–9–73, Cl. D26—5.
Standard Oil Co.: *See*—
Di Pierro, Michael J., and Mastrovito. 225,883.
Dolby, John T., and Adler. 225,886.
Dolby, John T., and Adler. 225,887.
Dolby, John T., and Adler. 225,888.
Hanig, Harvey, and Mastrovito. 225,884.
Steelcase, Inc.: *See*—
Buhk, Randall P. 225,843.
Stop-Motion Devices Corp.: *See*—
Matzel, George J., and Schussel. 225,916.
Strzelczyk, Gotz P., to Rowenta-Werke GmbH. Table lighter. 225,891, 1–9–73, Cl. D48—27.
Stut, Petrus J., to U.S. Philips Corp. Fan heater. 225,849, 1–9–73, Cl. D23—73.
Suuronen, Matti J. Bath stove. 225,850, 1–9–73, Cl. D23—84.
Systron-Donner Corp.: *See*—
Lincoln, Dale. 225,905.
Szabo, Bela G., to Bruce Plastics, Inc. Corner protector for binding straps surrounding bundles of sheets and the like. 225,829, 1–9–73, Cl. D8—263.
Tate, Michael D.: *See*—
McQuarrie, Harvey K., and Tate. 225,899.
Taylor, Jimmy L. Spinner toy. 225,878, 1–9–73, Cl. D34—15.
Tegner, Raymond U. H., to Amerock Corp. Pull. 225,820, 1–9–73, Cl. D8—158.
Thornell, Ernest L., to Marlin Toy Products, Inc. Toy airport structure. 225,881, 1–9–73, Cl. D34—15.
Thornell, Ernest L., to Marlin Toy Products, Inc. Poly-poly figure toy. 225,882, 1–9–73, Cl. D34—15.
Torrey, Frank R. Bench. 225,797, 1–9–73, Cl. D6—58.
Torrey, Frank R. Bench. 225,798, 1–9–73, Cl. D6—59.
Torrey, Frank R. Chair. 225,801, 1–9–73, Cl. D6—75.
Torrey, Frank R. Student desk. 225,804, 1–9–73, Cl. D6—138.
Torrey, Frank R. Work table for students. 225,805, 1–9–73, Cl. D6—146.
Torrey, Frank R. Student Desk. 225,806, 1–9–73, Cl. D6—179.
Torrey, Frank R. Student's carrel unit. 225,807, 1–9–73, Cl. D6—181.
Torrey, Frank R. Student carrel unit. 225,808, 1–9–73, Cl. D6—181.
Torrey, Frank R. Student desk. 225,809, 1–9–73, Cl. D6—181.
Torrey, Frank R. Study carrel. 225,812, 1–9–73, Cl. D6—189.
Torrey, Frank R. Study carrel. 225,813, 1–9–73, Cl. D6—189.
Torrey, Frank R. Storage shelf unit. 225,814, 1–9–73, Cl. D6—189.
Torrey, Frank R. Storage shelf unit. 225,815, 1–9–73, Cl. D6—189.
Torrey, Frank R. Backrest support. 225,817, 1–9–73, Cl. D6—200.
Torrey, Frank R. Double backrest unit. 225,818, 1–9–73, Cl. D6—200.
U.S. Philips Corp.: *See*—
Stut, Petrus J. 225,849.
Van Valkinburgh, Robert H., and R. A. Clowe, to Xerox Corp. Unattended telephone answering apparatus or similar article. 225,867, 1–9–73, Cl. D26—14.
Vath, William, to Long Island Mold and Tool Corp. Whirling toy ball or the like. 225,876, 1–9–73, Cl. D34—15.
Vuillemenot, Robert P.: *See*—
Horne, Willard R., and Vuillemenot. 225,832.
Wilcox, Brian L. to Dunlop Ltd. Tire. 225,915, 1–9–73, Cl. D90—20.
Wooten, Andry. Rotatable rack for phonograph records. 225,811, 1–9–73, Cl. D6—185.
Xerox Corp.: *See*—
Kalvitis, Robert E. 225,860.
Kalvitis, Robert E. 225,861.
Van Valkinburgh, Robert H., and Clowe. 225,867.
Yagi, Ohiko, to Kubushiki Kaisha Ricoh. Waterproof photographic camera. 225,901, 1–9–73, Cl. D61—1.
Yates, Patrick A., to Explosives Corp. of America. Hand operable blaster. 225,864, 1–9–73, Cl. D26—13.
Yates, Roger D. Food wrapper bag. 225,837, 1–9–73, Cl. D9—250.
Zahlman, Charles C., to A.E.I. Corp. Hot water dispenser. 225,917, 1–9–73, Cl. D94—3.

CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

46 3,708,799
74 3,708,800
94 3,708,801
155 3,708,802
198 3,708,803
244 3,708,804

CLASS 3

1 3,708,805

CLASS 4

10 3,708,806
172 3,708,807

CLASS 5

95 3,708,808
260 3,708,809
343 3,708,810

CLASS 8

17 3,709,656
116.3 3,709,657
129 3,709,658
137 3,709,659

CLASS 9

8P 3,708,811
8R 3,708,812

CLASS 11

3 3,708,813

CLASS 12

12.5 3,708,814
142E 3,708,815

CLASS 13

14 3,709,997
25 3,709,998
26 3,709,999

CLASS 15

21E 3,708,816
77 3,708,817
97 3,708,818
104.06R 3,708,819
104.16 3,708,820
210R 3,708,821
250.03 3,708,822
340 3,708,823
397 3,708,824

CLASS 16

49 3,708,825
52 3,708,826
98 3,708,827
164 Re.27,546

CLASS 17

1G 3,708,828
11 3,708,829

CLASS 19

5R 3,708,830
65T 3,708,832
236 3,708,831

CLASS 23

230R 3,709,662
232R 3,709,663
253R 3,709,661
269 3,709,665
285 3,709,664
300 3,709,666

CLASS 24

16PB 3,708,835
204 3,708,833
3,708,837
205.1C 3,708,836
230A 3,708,838
279 3,708,834

CLASS 28

15 3,708,839
203H 3,708,852

CLASS 29

1.1 3,708,841
38C 3,708,840
105A 3,708,842
3,708,843
123 3,708,844
132 3,708,845
156.8CF 3,708,846
159.01 3,708,847
163.5F 3,708,848
182.5 3,709,667
201 3,708,849
203D 3,708,853
203P 3,708,850
205 3,708,851
208B 3,708,854
237 3,708,855
401 3,708,856
419 3,708,858
430 3,708,859
3,708,860
432 3,708,861
433 3,708,862
454 3,708,863
470.1 3,708,865
479 3,708,864
498 3,708,866
520 3,708,868
525 3,708,857
527.6 3,708,869
580 3,708,870
592 3,708,871
597 3,708,872
600 3,708,873
604 3,708,874
605 3,708,875
625 3,708,876
628 3,708,877
3,708,878

CLASS 30

61 3,708,879
172 3,708,880
320 3,708,881

CLASS 32

10A 3,708,883
32 3,708,882

CLASS 33

20R 3,708,884
174L 3,708,885

CLASS 34

5 3,708,886
57A 3,708,887
83 3,708,889
169 3,708,888
242 3,708,890

CLASS 35

9A 3,708,891
9D 3,708,893
21 3,708,894
31D 3,708,892

CLASS 37

4 3,708,896
142A 3,708,895

CLASS 40

1 3,708,897
70 3,708,898
128 3,708,899
212 3,708,900

CLASS 42

1N 3,708,901
1R 3,708,902

CLASS 43

17.6 3,708,903
43.13 3,708,904
100 3,708,905
3,708,906
112 3,708,907
114 3,708,908

CLASS 44

6 3,709,700
72 3,709,668

CLASS 46

7 3,708,909
17 3,708,910
47 3,708,911
204 3,708,912
243LV 3,708,913

CLASS 48

215 3,709,669

CLASS 49

209 3,708,914
280 3,708,917
340 3,708,915
409 3,708,916

CLASS 51

3 3,708,918
26 3,708,919
32 3,708,920
131 3,708,921
165.92 3,708,922
165.93 3,708,923
205R 3,708,924
206P 3,708,925
273 3,708,926
310 3,708,936

CLASS 52

39 3,708,927
90 3,708,928
98 3,708,929
3,708,930
118 3,708,937
169 3,708,931
232 3,708,932
236 3,708,933
237 3,708,934
416 3,708,935
456 3,708,939
471 3,708,938
484 3,708,941
588 3,708,940
3,708,943
745 3,708,944
940 3,708,942

CLASS 53

22R 3,708,945
37 3,708,946
48 3,708,950
53 3,708,949
55 3,708,947
74 3,708,948
75 3,708,951
112B 3,708,952
124B 3,708,953
329 3,708,954

CLASS 55

20 3,708,956
31 3,708,955
36 3,708,957
73 3,708,981
89 3,708,958
97 3,708,959
169 3,708,960
261 3,708,961
300 3,708,962
373 3,708,963
392 3,708,964
488 3,708,965

CLASS 56

6 3,708,966
12.7 3,708,967
16.5 3,708,968

CLASS 57

55.5 3,708,969
140R 3,708,970

CLASS 58

3 3,708,971
6R 3,708,972
19 3,708,973
28R 3,708,974
121R 3,708,975

CLASS 60

39.25 3,708,976
52US 3,708,977
53R 3,708,978
59R 3,708,979
274 3,708,980

CLASS 61

1F 3,708,982
3,708,983
43 3,708,984
46 3,708,986
3,708,987
46.5 3,708,985
48 3,708,988
64 3,708,989
69R 3,708,990
69 3,708,991

CLASS 62

35 3,708,993
50 3,708,994
63 3,708,995
71 3,708,992
116 3,708,996
210 3,708,998
449 3,708,997

CLASS 64

11R 3,708,999
13 3,709,000
25 3,709,001

CLASS 65

8 3,709,670
19 3,709,671
30 3,709,672
182R 3,709,673

CLASS 66

9B 3,709,002
50R 3,709,003
57 3,709,004

CLASS 68

6 3,709,005

CLASS 70

364R 3,709,006

CLASS 71

1 3,709,674
35 3,709,675
92 3,709,676
94 3,709,677

CLASS 72

8 3,709,007
3,709,008
3,709,009
3,709,010
10 3,709,011
21 3,709,012
22 3,709,013
60 3,709,014
71 3,709,015
111 3,709,018
123 3,709,016
205 3,709,017
242 3,709,019
283 3,709,020
289 3,709,021
311 3,709,022
402 3,709,023
420 3,709,024
421 3,709,025

CLASS 73

12 3,709,026
37.5 3,709,027
38 3,709,028
67.8R 3,709,029
71.1 3,709,030
101 3,709,031
147 3,709,036
154 3,709,032
178T 3,709,033
204 3,709,035
231 3,709,037
313 3,709,038
336 3,709,039
354 3,709,040
466 3,709,043
515 3,709,041
516R 3,709,042

CLASS 74

2 3,709,044
5F 3,709,045
15.86 3,709,046
25 3,709,047
53 3,709,048
89.2 3,709,049
121 3,709,050
230.17E 3,709,052
230.17M 3,709,051
243R 3,709,053
258 3,709,054
462 3,709,055
469 3,709,056
492 3,709,057
594.4 3,709,058
650 3,709,069
661 3,709,059
687 3,709,060
3,709,061
722 3,709,062
750 3,709,063
752A 3,709,064
753 3,709,065
866 3,709,066
3,709,068
869 3,709,067

CLASS 75

6 3,709,680
10R 3,709,678
26 3,709,679
109 3,709,681
134C 3,709,682

CLASS 81

3J 3,709,071
57.13 3,709,072
119 3,709,073

CLASS 82

36R 3,709,074

CLASS 83

13 3,709,274
27 3,709,075
42 3,709,076
152 3,709,077
226 3,709,078
355 3,709,080
375 3,709,079
404.2 3,709,265
411 3,709,081
575 3,709,083
618 3,709,082
751 3,709,273
761 3,709,266

CLASS 84

1.15 3,709,084
166 3,709,085

CLASS 85

7 3,709,086
61 3,709,087
74 3,709,088
77 3,709,089

CLASS 87

4 3,709,090

CLASS 89

189 3,709,091
191 3,709,092

CLASS 90

8 3,709,093
11C 3,709,094
3,709,095
15 3,709,096

CLASS 91

46 3,709,098
54 3,709,099
189 3,709,100
424 3,709,101
437 3,709,103
495 3,709,104
503 3,709,102

CLASS 92

137 3,709,105
138 3,709,106
169 3,709,107
3,709,108
186 3,709,109

CLASS 93

36.6 3,709,110
44 3,709,114
58.2 3,709,111

CLASS 94

1.5 3,709,112
18 3,709,115
46AC 3,709,116

CLASS 95

4.5R 3,709,117
10CT 3,709,113
11R 3,709,119
3,709,120
3,709,122
11 3,709,121
11.5R 3,709,118
3,709,123
12 3,709,124
3,709,125
13 3,709,126
31FL 3,709,127
31FM 3,709,128
39 3,709,129
3,709,130
3,709,131
45 3,709,132
3,709,133
60 3,709,134
3,709,135
62 3,709,136
64D 3,709,137
93 3,709,138

CLASS 96

1R 3,709,683
1.5 3,709,684
1.7 3,709,685
2 3,709,686
29L 3,709,687
36.2 3,709,695
48 3,709,688
64 3,709,689
67 3,709,690
87R 3,709,691
108 3,709,692
118 3,709,693

CLASS 98

2.16 3,709,139

CLASS 99

28 3,709,694
80R 3,709,696
107 3,709,697
3,709,698
3,709,699
140N 3,709,701
174 3,709,702
176 3,709,703
331 3,709,140
343 3,709,141
357 3,709,142

CLASS 101

37 3,709,143
45 3,709,144
66 3,709,145
93C Re.27,542
317 3,709,146
351 3,709,147

CLASS 102

10 3,709,148
22 3,709,149

CLASS 104

25 3,709,150

CLASS 105

26R 3,709,153
199C 3,709,151
253 3,709,152
368R 3,709,154
3,709,155
369A 3,709,156
409 3,709,157

CLASS 106

39R 3,709,704
54 3,709,705
57 3,709,706
87 3,709,707
216 3,709,708
288B 3,709,709
300 3,709,710

CLASS 108

43 3,709,158
44 3,709,159
51 3,709,160
3,709,161
3,709,162
53 3,709,163
3,709,164
3,709,165
106 3,709,166
128 3,709,167

CLASS 109

1S 3,709,168
29 3,709,169

CLASS 110

8R 3,709,170
3,709,171

CLASS 112

79R 3,709,173
84 3,709,172
231 3,709,174
252 3,709,176
262 3,709,175

CLASS 114

46 3,709,177
56 3,709,178
66.5H 3,709,180
66.5P 3,709,179
72 3,709,181
206R 3,709,182
220 3,709,183
222 3,709,184

CLASS 115

.5 3,709,185
34A 3,709,186
35 3,709,187

CLASS 116

114R 3,709,188
132 3,709,189

CLASS 117

2R 3,709,711
3,709,712
17.5 3,709,713
47A 3,709,714
50 3,709,715
63 3,709,716
70C 3,709,717
93.31 3,709,718
3,709,719
95 3,709,720
104R 3,709,721
114R 3,709,722
124A 3,709,723
142 3,709,724
161UF 3,709,725
201 3,709,726
213 3,709,727
218 3,709,728
227 3,709,729
238 3,709,730

CLASS 118

2 3,709,190
8 3,709,191
3,709,192
19 3,709,193
50.1 3,709,194

CLASS 119

2 3,709,195
14.04 3,709,196
29 3,709,197

CLASS 122

14 3,709,198

CLASS 123

8.47 3,709,199
41.82 3,709,200
64 3,709,201
73R 3,709,202
119A 3,709,203
119B 3,709,204
139AM 3,709,205
148E 3,709,206

CLASS 125

11 3,709,207

CLASS 126

271.2A 3,709,208
400 3,709,209

CLASS 127

58 3,709,731

CLASS 128

1R 3,709,210
2A 3,709,211
2.06B 3,709,212
2.08 3,709,213
4 3,709,214
20 3,709,215
69 3,709,216
75 3,709,217
92A 3,709,218
3,709,219
132R 3,709,220
156 3,709,221
213 3,709,222
214.4 3,709,223
239 3,709,224
254 3,709,225
340 3,709,226
351 3,709,227
410 3,709,228
419P 3,709,229
486 3,709,230

CLASS 130

30H 3,709,231

CLASS 131

140C 3,709,232
176 3,709,233

CLASS 132

45R 3,709,234
80R 3,709,235

CLASS 134

57D 3,709,732
104 3,709,236

CLASS 135

5R 3,709,237
20R 3,709,238

CLASS 136

83R 3,709,734
86A 3,709,735
86R 3,709,736
148 3,709,737
3,709,738
208 3,709,739
217 3,709,740

CLASS 137

68 3,709,239
3,709,240
71 3,709,241
81 3,709,242
81.5 3,709,243
106 3,709,244
216 3,709,246
271 3,709,247
3,709,248
296 3,709,249
318 3,709,250
343 3,709,251
355.17 3,709,252
595 3,709,253
609 3,709,254
614.19 3,709,255
625.47 3,709,256
625.64 3,709,257
627.5 3,709,258
630.15 3,709,259

CLASS 138

90 3,709,260
96T 3,709,261

CLASS 139

14 3,709,262
420 3,709,263

CLASS 140

106 3,709,264

CLASS 144

2Z 3,709,267
208B 3,709,268
208E 3,709,269
3,709,272
268 3,709,270
309 3,709,271

CLASS 148

1.5 3,709,741
6.1 3,709,742
6.2 3,709,743
11.5M 3,709,745
12 3,709,744
175 3,709,746

CLASS 149

22 3,709,747
109 3,709,748

CLASS 152

243 3,709,275
362 3,709,276
374 3,709,277

CLASS 156

11 3,709,749
72 3,709,750
78 3,709,751
79 3,709,752
108 3,709,753
161 3,709,754
177 3,709,764
235 3,709,755
364 3,709,756
423 3,709,757
494 3,709,758
506 3,709,759
527 3,709,760
576 3,709,761
580 3,709,762
584 3,709,763

CLASS 157

1 3,709,278
1.24 3,709,279

CLASS 161

1 3,709,765
3.5 3,709,766
14 3,709,767
37 3,709,733
44 3,709,770
57 Re.27,544
63 3,709,768
67 3,709,771
139 3,709,772
159 3,709,774
162 3,709,775
176 3,709,773
189 3,709,776
232 3,709,777

CLASS 162

71 3,709,778
3,709,779
167 3,709,857
168 3,709,780

CLASS 164

112 3,709,280
153 3,709,281
187 3,709,282
252 3,709,283
281 3,709,284
282 3,709,285
283 3,709,286
292 3,709,287
325 3,709,288

CLASS 165

12 3,709,289
22 3,709,769
47 3,709,290

CLASS 166

.5 3,709,291
68 3,709,292
232 3,709,293
243 3,709,294
245 3,709,295
253 3,709,296
273 3,709,297
276 3,709,298
278 3,709,299
280 3,709,300

CLASS 168

25 3,709,301

CLASS 169

9 3,709,302

CLASS 171

86 3,709,303

CLASS 172

450 3,709,034
3,709,304

CLASS 173

30 3,709,305
44 3,709,097
132 3,709,306

CLASS 174

15BH 3,710,001
15C 3,710,000
18 3,710,002
37 3,710,003
38 3,710,004
89 3,710,005
101.5 3,710,006
120AR 3,710,007
3,710,009
131A 3,710,008

CLASS 175

8 3,709,307
329 3,709,308

CLASS 176

39 3,709,781

CLASS 177

165 3,709,309
168 3,709,310
203 3,709,311

CLASS 178

5.2R 3,710,020
5.2 3,710,012
5.4BD 3,710,015
5.4ST 3,710,013
3,710,014
5.4E 3,710,011
5.4R 3,710,010
5.8R 3,710,016
6.8 3,710,017
7.2 3,710,018
7.6 3,710,019
58 3,710,021
70R 3,710,022

CLASS 179

1G 3,710,023
5P 3,710,024
15AL 3,710,026
15BS 3,710,027
15BY 3,710,028
3,710,056
15A 3,710,025
18AG 3,710,030
18BE 3,710,033
18ES 3,710,029
84VF 3,710,031
84L 3,710,032
100.1TD 3,710,034
100.2C 3,710,038
100.2K 3,710,036
100.2R 3,710,037
100.2Z 3,710,035
3,710,039
110A 3,710,040

CLASS 180

5 3,709,312
21 3,709,313
44R 3,709,314
50 3,709,315
69C 3,709,316
103 3,709,317
116 3,709,318

CLASS 181

33HB 3,709,319
40 3,709,320
50 3,709,321

CLASS 182

62.5 3,709,322
115 3,709,323

CLASS 184

1E 3,709,324

CLASS 187

8.72 3,709,330
9 3,709,331

CLASS 188

71.1 3,709,332
71.9 3,709,333
79.5P 3,709,334
296 3,709,335
351 3,709,336

CLASS 191

22R 3,709,337

CLASS 192

.094 3,709,344
3S 3,709,338
3.58 3,709,340
41S 3,709,339
52 3,709,342
64 3,709,341
67R 3,709,343

CLASS 193

34 3,709,345
35C 3,709,346

CLASS 194

94 3,709,347

CLASS 195

1.8 3,709,782
28N 3,709,786
28R 3,709,783
3,709,784
29 3,709,785
30 3,709,787
31R 3,709,788
51R 3,709,789
66R 3,709,790
127 3,709,791

CLASS 198

19 3,709,348
25 3,709,349
28 3,709,353
33AA 3,709,354
35 3,709,350
37 3,709,351
59 3,709,355
131 3,709,352
162 3,709,356
213 3,709,357

CLASS 200

17R 3,710,042
31R 3,710,043
37R 3,710,045
50AA 3,710,044
51R 3,710,046
51.1 3,710,047
52R 3,710,048
61.27 3,710,049
61.43 3,710,050
61.45R 3,710,051
61.68 3,710,052
67B 3,710,053
86R 3,710,054
153R 3,710,055
164R 3,710,057
166PC 3,710,060
166C 3,710,058
3,710,059
3,710,061

CLASS 202

248 3,709,794

CLASS 203

4 3,709,793
31 3,709,795

CLASS 204

1T 3,709,796
16 3,709,797
49 3,709,798
54R 3,709,799
59R 3,709,800
59 3,709,801
137R 3,709,802
140 3,709,803
159.2 3,709,806
159.22 3,709,804
3,709,805
162R 3,709,807
181 3,709,808
192 3,709,809
195G 3,709,813
195M 3,709,811
195P 3,709,812
195R 3,709,810

CLASS 206

62R 3,709,358
65R 3,709,326
65Y 3,709,325

CLASS 208

59 3,709,814
112 3,709,817

CLASS 209

73 3,709,327
3,709,328
75 3,709,329
138 3,709,359
215 3,709,360

CLASS 210

7 3,709,792
32 3,709,818
58 3,709,815
3,709,816
83 3,709,361
108 3,709,362
195 3,709,363
3,709,364
233 3,709,365
242 3,709,366
321 3,709,367
365 3,709,368
400 3,709,369
527 3,709,370

CLASS 211

49D 3,709,371
74 3,709,372
113 3,709,373
163 3,709,374

CLASS 212

58 3,709,375

CLASS 213

62R 3,709,376

CLASS 214

1BB 3,709,379
1BD 3,709,377
1D 3,709,380
1Q 3,709,378
1R 3,709,382
16B 3,709,383
16.4R 3,709,384
17C 3,709,385
23 3,709,386
35R 3,709,387
80 3,709,388
82 3,709,389
111R 3,709,381
147AS 3,709,390
300 3,709,391
620 3,709,392
674 3,709,393
750 3,709,394

CLASS 215

38R 3,709,395

CLASS 219

10.049 3,710,062
10.55 3,710,063
3,710,064
3,710,065
61 3,710,066
69C 3,710,067
73 3,710,068
76 3,710,070
85 3,710,069
93 3,710,071
121EB 3,710,072
146 3,710,073
203 3,710,074
211 3,710,075
412 Re.27,545
449 3,710,076
492 3,710,077

CLASS 220

1.5 3,709,396
42A 3,709,397
55C 3,709,401
67 3,709,398
3,709,399
113 3,709,400

CLASS 221

33 3,709,402
70 3,709,403
120 3,709,404
209 3,709,405

CLASS 222

55 3,709,406
129.4 3,709,408
402 3,709,409
402.16 3,709,410
512 3,709,411

CLASS 223

66 3,709,407

CLASS 224

4E 3,709,412
42.1H 3,709,413

CLASS 225

2 3,709,414
97 3,709,415

CLASS 226

2 3,709,416
17 3,709,418
67 3,709,419
76 3,709,417

CLASS 227

7 3,709,420
10 3,709,421

CLASS 228

13 3,709,422
44 3,709,423
3,709,424

CLASS 229

23C 3,709,425
62.5 3,709,426

CLASS 232

43.1 3,709,427

CLASS 233

19A 3,709,428
26 3,709,429

CLASS 235

54F 3,710,105
61.11E 3,710,078
79 3,710,108
91R 3,710,079
92GA 3,710,080
109 3,709,430
150.2 3,710,086
150.24 3,710,081
151 3,710,082
151.3 3,710,083
151.32 3,710,084
164 3,710,085
189 3,710,087
3,710,088
193 3,710,089
201ME 3,710,123

CLASS 236

68R 3,709,431

CLASS 239

4 3,709,432
8 3,709,433
3,709,434
206 3,709,435
287 3,709,436
343 3,709,437
417.5 3,709,438

CLASS 240

2MA 3,710,091
2R 3,710,090
6.4R 3,710,092
7.1H 3,710,093
9A 3,710,094
41.36 3,710,095
41.6 3,710,097
49 3,710,098
51.11 3,710,099
67 3,710,096

CLASS 241

15 3,709,439
36 3,709,440
65 3,709,442
94 3,709,441
285 3,709,443

CLASS 242

47.04 3,709,444
55.2 3,709,445

CLASS 244

1SS 3,709,447
1N 3,709,446
118 3,709,450

CLASS 246

28R 3,710,100

CLASS 248

46 3,709,448
101 3,709,449
205R 3,709,451
223 3,709,452
328 3,709,453
351 3,709,454
361A 3,709,455
475 3,709,456

CLASS 249

91 3,709,457
95 3,709,458
134 3,709,459

CLASS 250

49.5AE 3,710,102
3,710,103
49.5T 3,710,101
51.5 3,710,104
66 3,710,106
71.5R 3,710,107
83CD 3,710,109
83.3UV 3,710,111
3,710,115
83.3R 3,710,112
3,710,113
83.6ET 3,710,110
83.6R 3,710,116
83.6W 3,710,114
106SC 3,710,120
106S 3,710,118

3,710,119
106T 3,710,117
108R 3,710,121
199 3,710,122
206 3,710,124
213VT 3,710,125
3,710,126
213R 3,710,127
219DF 3,710,129
219WD 3,710,128
239 3,710,130

CLASS 251

11 3,709,460
58 3,709,461
118 3,709,462
127 3,709,245
129 3,709,463

CLASS 252

8.5P 3,709,819
62.2 3,709,820
3,709,821
62.6 3,709,822
136 3,709,823
142 3,709,824
158 3,709,825
300 3,709,828
3,709,830
301.4P 3,709,826
301.4R 3,709,827
364 3,709,831
429R 3,709,832
448 3,709,833
461 3,709,829
470 3,709,834
513 3,709,835
525 3,709,836
527 3,709,837
545 3,709,838

CLASS 254

29R 3,709,464
45 3,709,467
95 3,709,465
187 3,709,466

CLASS 259

4 3,709,468

CLASS 260

2BP 3,709,839
2EC 3,709,840
2.2R 3,709,841
2.5AN 3,709,843
2.5D 3,709,842
2.5P 3,709,844
17.4BB 3,709,845
18EP 3,709,846
18PN 3,709,847
18N 3,709,865
19UA 3,709,848
27R 3,709,866
28.5A 3,709,867
29.2N 3,709,858
29.3 3,709,849
30.2 3,709,863
32.6N 3,709,864
47CP 3,709,862
47EC 3,709,861
47UP 3,709,924
75R 3,709,859
77.5AP 3,709,860
82 3,709,854
87.3 3,709,855
87.7 3,709,856
88.2D 3,709,853
88.2S 3,709,852
93.7 3,709,850
94.3 3,709,851
121 3,709,868
153 3,709,869
186 3,709,870
199 3,709,871
207.1 3,709,872
209D 3,709,875
211.5R 3,709,873
3,709,874
231A 3,709,876
232 3,709,877
239.55 3,709,878
243AA 3,709,879
243C 3,709,880
244R 3,709,882
247 3,709,881
248CS 3,709,883
249.6 3,709,884
250A 3,709,885
3,709,886
251A 3,709,887
256.4F 3,709,888
283R 3,709,890
285.5 3,709,891
293.54 3,709,893
293.83 3,709,892
293.85 3,709,889
294.8C 3,709,894
307B 3,709,895
307D 3,709,896
307F 3,709,897
3,709,904
307G 3,709,902
308R 3,709,898
3,709,899
309 3,709,900
310R 3,709,901
314.5 3,709,903
326A 3,709,910
326S 3,709,907
326.11 3,709,908
326.5M 3,709,906
326.83 3,709,905
330.5 3,709,909
332.2A 3,709,911
332.3R 3,709,913
340.5 3,709,914
3,709,915
343.6 3,709,912
347.2 3,709,917
429.7 3,709,918
448.2B Re.27,541
449.5 3,709,919
453R 3,709,920
459 3,709,939
465.003 3,709,921
465.4 3,709,922
468R 3,709,923
471 3,709,925
473G 3,709,926
480 3,709,916
486AC 3,709,927
486B 3,709,928
486 3,709,929
515H 3,709,930
3,709,931
543P 3,709,932
544Y 3,709,933
546 3,709,934
552SC 3,709,935
554 3,709,936
557B 3,709,937
558D 3,709,938
561P 3,709,940
566R 3,709,941
583DD 3,709,942
587 3,709,943
598 3,709,944
609R 3,709,945
617E 3,709,946
649 3,709,947
653.3 3,709,948
654R 3,709,949
659A 3,709,950
680E 3,709,951
683.15D 3,709,952
3,709,953
3,709,954
3,709,955
754 3,709,958
827 3,709,956
897B 3,709,957
940 3,709,959
941 3,709,960
949 3,709,961
3,709,962

CLASS 261

44R 3,709,469
91 3,709,470
124 3,709,471

CLASS 263

6E 3,709,472
19R 3,709,473
21B 3,709,475
32R 3,709,474
40 Re.27,543

CLASS 264

.5 3,709,963
22 3,709,964
45 3,709,965
46 3,709,966
89 3,709,967
92 3,709,968
103 3,709,969
176F 3,709,970
182 3,709,971
236 3,709,972
244 3,709,973

CLASS 266

34A 3,709,476
42 3,709,477

CLASS 267

137 3,709,478

CLASS 269

309 3,709,479

CLASS 270

58 3,709,480

CLASS 271

30A 3,709,481
37 3,709,482
44R 3,709,483
49 3,709,484
57 3,709,485
64 3,709,492

CLASS 272

30 3,709,486
58 3,709,487
3,709,488

CLASS 273

1B 3,709,489
29A 3,709,490
58C 3,709,491
86F 3,709,493
89 3,709,494
101 3,709,495
128CS 3,709,496
130R 3,709,497
131AB 3,709,498
138A 3,709,499
138R 3,709,500
149P 3,709,501
161 3,709,502

CLASS 274

9A 3,709,503
10S 3,709,504
23R 3,709,505

CLASS 277

12 3,709,506
188 3,709,507

CLASS 279

1C 3,709,508

CLASS 280

11.35T 3,709,509
3,709,510
3,709,511
28 3,709,512
37 3,709,513
41C 3,709,514
87.02W 3,709,515
96.2R 3,709,516
104 3,709,517
150E 3,709,520
150R 3,709,519
150.5 3,709,518
421 3,709,521
453 3,709,522
502 3,709,523

CLASS 282

22R 3,709,524

CLASS 283

1 3,709,525

CLASS 285

73 3,709,526
110 3,709,527
286 3,709,529
316 3,709,528

CLASS 287

52.07 3,709,530
53H 3,709,531
54C 3,709,532
119 3,709,534
189.36H 3,709,533

CLASS 289

1.5 3,709,536

CLASS 292

128 3,709,538
145 3,709,539
204 3,709,540
216 3,709,537
337 3,709,541

CLASS 293

73 3,709,542

CLASS 294

31.2 3,709,544
3,709,545
67AA 3,709,547
70 3,708,857
74 3,709,548
81SF 3,709,543
96 3,709,546
111 3,709,550
118 3,709,549

CLASS 296

23R 3,709,551
28C 3,709,553
28M 3,709,552

CLASS 297

26 3,709,554
142 3,709,555
188 3,709,556
230 3,709,557
250 3,709,558
306 3,709,535
445 3,709,559
3,709,560

CLASS 301

6E 3,709,561

CLASS 302

13 3,709,562

CLASS 303

6C 3,709,563
16 3,709,564
21BE 3,709,565
3,709,566
3,709,567
22R 3,709,568

CLASS 307

10R 3,710,131
43 3,710,132
66 3,710,133
3,710,134
88 3,710,135
109 3,710,136
118 3,710,138
131 3,710,157
141 3,710,137
229 3,710,139
235 3,710,141
242 3,710,142
244 3,710,143
246 3,710,147
260 3,710,144
270 3,710,145
271 3,710,146
295 3,710,148
300 3,710,041
310 3,710,149

CLASS 308

4A 3,709,569
26 3,709,570
27 3,709,571
161 3,709,573
187.2 3,709,572
236 3,709,574
3,709,575

CLASS 310

8.1 3,710,150
8.9 3,710,151
11 3,710,152
3,710,153
41 3,710,155
50 3,710,154
54 3,710,156
156 3,710,158
239 3,710,159
247 3,710,160

CLASS 312

138A 3,709,576
245 3,709,578
263 3,709,577

CLASS 313

60 3,710,162
63 3,710,163
77 3,710,164
85S 3,710,165
93 3,710,166
108A 3,710,167
141 3,710,168
222 3,710,169
330 3,710,170
338 3,710,172
346 3,710,161

CLASS 315

12 3,710,173
3,710,179
22 3,710,174
27TD 3,710,171
30 3,710,175
31R 3,710,176
106 3,710,177
149 3,710,178
153 3,710,180
175 3,710,181
199 3,710,182
209 3,710,183
227 3,710,184
240 3,710,185

CLASS 317

5 3,710,186
15 3,710,187
18D 3,710,190
26 3,710,188
27R 3,710,189
62 3,710,191
66 3,710,212
96 3,710,192
100 3,710,193
101CC 3,710,196
101C 3,710,195
101R 3,710,194
118 3,710,197
120 3,710,198
122 3,710,199
134 3,710,200
230 3,710,201
234R 3,710,202
3,710,203
3,710,205
235R 3,710,204
3,710,206
3,710,207
235 3,710,208
249R 3,710,209
258 3,710,210
261 3,710,211

CLASS 318

102 3,710,214
227 3,710,215
231 3,710,218
328 3,710,220
331 3,710,213
3,710,219
373 3,710,216
467 3,710,221
470 3,710,217
604 3,710,222
661 3,710,223

CLASS 320

2 3,710,224
9 3,710,225
15 3,710,226
59 3,710,227
61 3,710,228

CLASS 321

9A 3,710,229
45C 3,710,230

CLASS 323

9 3,710,231
43.5S 3,710,232
45 3,710,233
100 3,710,234

CLASS 324

30R 3,710,237
34R 3,710,235
37 3,710,236
51 3,710,238
52 3,710,239
3,710,240
54 3,710,241
3,710,242
58.5B 3,710,243
61R 3,710,244
96 3,710,247
99D 3,710,248
103P 3,710,249
115 3,710,250
126 3,710,252
138 3,710,245
140D 3,710,253
142 3,710,254
158F 3,710,251
162 3,710,246

CLASS 325

4 3,710,255
6 3,710,256
60 3,710,257
105 3,710,258
187 3,710,259
308 3,710,260
346 3,710,261

CLASS 328

41 3,710,262
61 3,710,265
91 3,710,263
3,710,264
133 3,710,140
233 3,710,266

CLASS 329

192 3,710,267

CLASS 330

4.9 3,710,268
16 3,710,269
29 3,710,270
35 3,710,271
53 3,710,272

CLASS 331

1A 3,710,273
3,710,274
37 3,710,275
45 3,710,276
94.5 3,710,277
3,710,278
3,710,279

CLASS 333

1.1 3,710,280
6 3,710,281
8 3,710,282
30R 3,710,283
75 3,710,284
79 3,710,285
81B 3,710,286

CLASS 334

136 3,710,342

CLASS 335

160 3,710,288
213 3,710,289
230 3,710,290
306 3,710,291

CLASS 336

60 3,710,292
198 3,710,293

CLASS 337

66 3,710,294
166.6 3,710,295
213 3,710,296
290 3,710,297
401 3,710,298

CLASS 339

17CF 3,710,299
22B 3,710,300
3,710,301
3,710,302
61M 3,710,303
74R 3,710,304
97R 3,710,305
108 3,710,306
116C 3,710,307
176MP Re.27,540
195R 3,710,287
198N 3,710,308
217S 3,710,309

CLASS 340

3R 3,710,310
27 3,710,311
31R 3,710,312
33 3,710,313
58 3,710,314
62 3,710,315
63 3,710,316
64 3,710,317
112.5 3,710,348
146.1AB 3,710,318
146.3H 3,710,323
146.3J 3,710,319
3,710,322
146.3 3,710,321
149R 3,710,320
172.5 3,710,324
3,710,325
3,710,326
3,710,327
3,710,328
3,710,349
3,710,350
3,710,351
173.2 3,710,352
3,710,353
174PW 3,710,355
174TF 3,710,354
3,710,356
174.1B 3,710,358
3,710,361
174.1C 3,710,357
174.1F 3,710,362
174.1G 3,710,359
174.1H 3,710,360
213 3,710,363
214 3,710,364
237S 3,710,365
248P 3,710,366
251 3,710,367
267C 3,710,368
274 3,710,369
275 3,710,370
276 3,710,372
283 3,710,371
310 3,710,373
347AD 3,710,377
3,710,378
347CC 3,710,376
347NT 3,710,374
347P 3,710,375
379 3,710,379

CLASS 343

5R 3,710,380
6.5R 3,710,382
7ED 3,710,383
7A 3,710,384
7.4 3,710,389
8 3,710,381
9 3,710,385
3,710,386
12R 3,710,387
16M 3,710,390
16R 3,710,388
100SA 3,710,329
3,710,330
105R 3,710,334
112R 3,710,331
3,710,335
113R 3,710,332
114 3,710,333
225 3,710,336
701 3,710,337
708 3,710,338
715 3,710,339
725 3,710,340
779 3,710,341

CLASS 346

136 3,710,343

CLASS 350

30 3,709,579
157 3,709,580
174 3,709,581
202 3,709,582
260 3,709,583
266 3,709,584
305 3,709,585
320 3,709,586

CLASS 351

106 3,709,587

CLASS 352

78R 3,709,588

CLASS 353

13 3,709,589
120 3,709,590

CLASS 355

4 3,709,593
3,709,594
8 3,709,592
14 3,709,595
38 3,709,601
49 3,709,602
60 3,709,603
61 3,709,597
64 3,709,604
109 3,709,596
126 3,709,591

CLASS 356

28 3,709,599
51 3,709,600
109 3,709,605
3,709,606
152 3,709,607
3,709,608
3,709,609
160 3,709,610
170 3,709,611
178 3,709,612
198 3,709,598
202 3,709,613
208 3,709,614
224 3,709,615
246 3,709,616
247 3,709,617

CLASS 401

78 3,709,618
108 3,709,619
195 3,709,620

CLASS 408

11 3,709,621
20 3,709,622
22 3,709,623
127 3,709,624
181 3,709,625
204 3,709,627
229 3,709,628

CLASS 415

17 3,709,626
56 3,709,629
199 3,709,630

CLASS 416

95 3,709,631
97 3,709,632
134 3,709,633
142 3,709,634
183 3,709,635

CLASS 417

12 3,709,636
405 3,709,637
454 3,709,638
493 3,709,639

CLASS 423

63 3,709,974
206 3,709,975
224 3,709,976
240 3,709,978
244 3,709,977
328 3,709,979
339 3,709,980
346 3,709,981
466 3,709,982
573 3,709,983
610 3,709,984

CLASS 424

1 3,709,985
128 3,709,986
3,709,987
219 3,709,988
232 3,709,989
243 3,709,990
266 3,709,991
270 3,709,992
317 3,709,993
3,709,994
330 3,709,996
341 3,709,995

CLASS 425

4 3,709,640
3,709,651
7 3,709,641
72 3,709,642
109 3,709,643
160 3,709,644
192 3,709,645
217 3,709,646
224 3,709,647
3,709,648
363 3,709,649
367 3,709,650

CLASS 427

566 3,709,660

CLASS 431

96 3,709,652
279 3,709,653
284 3,709,654
344 3,709,655

CLASS 444

1 3,710,344
3,710,345
3,710,346
3,710,347

CLASSIFICATION OF DESIGNS

D 2— 258 225,793
351 225,794
D 6— 41 225,795
43 225,796
58 225,797
59 225,798
63 225,799
71 225,800
75 225,801
116 225,802
130 225,803
138 225,804
146 225,805
179 225,806
181 225,807
225,808
225,809
184 225,810
185 225,811
189 225,812
225,813
225,814
225,815
196 225,816
200 225,817
225,818
D 8— 64 225,819
158 225,820
166 225,821
179 225,822
189 225,823
225,824
225,825
191 225,826
225,827
225,828
263 225,829
D 9— 3 225,830
40 225,831
100 225,832
115 225,833
143 225,834
169 225,835
190 225,836
207 225,894
250 225,837
290 225,838
D14— 3 225,839
225,840
225,841
30 225,842
D15— 1 225,843
D16— 225,844
2 225,845
D18— 225,846
D22— 1 225,847
D23— 49 225,848
73 225,849
84 225,850
122 225,851
129 225,854
146 225,852
165 225,853
D24— 1 225,855
D25— 225,856
D26— 225,857
5 225,858
225,859
225,860
225,861
225,862
225,863
13 225,864
14 225,865
225,866
225,867
225,868
D30— 35 225,869
D33— 3 225,870
11 225,871
D34— 5 225,872
225,873
225,874
225,875
15 225,876
225,877
225,878
225,879
225,880
225,881
225,882
D44— 1 225,883
225,884
9 225,885
10 225,886
225,887
225,888
29 225,889
D48— 20 225,890
27 225,891
29 225,892
D49— 23 225,893
D53— 3 225,895
D54— 8 225,897
12 225,896
225,898
D56— 4 225,899
D57— 1 225,900
D61— 225,901
225,902
225,903
D71— 225,904
D72— 225,905
D74— 2 225,906
D83— 1 225,907
12 225,908
D85— 2 225,909
D86— 10 225,910
D88— 3 225,911
D90— 8 225,912
20 225,913
225,914
225,915
D92— 15 225,916
D94— 3 225,917
D95— 225,918

CLASSIFICATION OF PLANTS

P. — 20 03,287
P. — 49 03,286
P. — 68 03,290
P. — 74 03,288
P. — 80 03,289

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama..... 1
Alaska..... 2
American Samoa..... 3
Arizona..... 4
Arkansas..... 5
California..... 6
Canal Zone..... 7
Colorado..... 8
Connecticut..... 9
Delaware..... 10
District of Columbia..... 11
Florida..... 12
Georgia..... 13
Guam..... 14
Hawaii..... 15
Idaho..... 16
Illinois..... 17
Indiana..... 18
Iowa..... 19
Kansas..... 20
Kentucky..... 21
Louisiana..... 22
Maine..... 23
Maryland..... 24
Massachusetts..... 25
Michigan..... 26
Minnesota..... 27
Mississippi..... 28
Missouri..... 29
Montana..... 30
Nebraska..... 31
Nevada..... 32
New Hampshire..... 33
New Jersey..... 34
New Mexico..... 35
New York..... 36
North Carolina..... 37
North Dakota..... 38
Ohio..... 39
Oklahoma..... 40
Oregon..... 41
Pennsylvania..... 42
Puerto Rico..... 43
Rhode Island..... 44
South Carolina..... 45
South Dakota..... 46
Tennessee..... 47
Texas..... 48
Utah..... 49
Vermont..... 50
Virginia..... 51
Virgin Islands..... 52
Washington..... 53
West Virginia..... 54
Wisconsin..... 55
Wyoming..... 56
U.S. Air Force..... 57
U.S. Army..... 58
U.S. Navy..... 59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,709,183	3,709,026	3,709,430	3,710,103	3,708,946		3,710,263
3,709,488	3,709,036	3,709,454	3,710,105	3,708,959		3,710,264
3,709,716	3,709,044	3,709,460	3,710,107	3,709,019		3,710,341
3,710,152	3,709,060	3,709,462	3,710,109	3,709,021	13 :	3,708,799
4 : 3,708,862	3,709,061	3,709,466	3,710,120	3,709,027		3,709,173
3,709,091	3,709,088	3,709,469	3,710,126	3,709,049		3,709,280
3,709,288	3,709,110	3,709,508	3,710,137	3,709,054		3,709,303
3,709,321	3,709,142	3,709,519	3,710,140	3,709,073		3,709,391
3,709,491	3,709,147	3,709,522	3,710,168	3,709,074	15 :	3,710,335
3,709,495	3,709,158	3,709,538	3,710,182	3,709,189	16 :	3,708,942
3,709,523	3,709,171	3,709,546	3,710,185	3,709,246		3,710,230
3,709,695	3,709,174	3,709,549	3,710,218	3,709,331	17 :	3,708,802
3,709,818	3,709,182	3,709,556	3,710,221	3,709,427		3,708,824
3,710,006	3,709,184	3,709,558	3,710,223	3,709,515		3,708,827
3,710,091	3,709,185	3,709,580	3,710,235	3,709,534		3,708,843
3,710,092	3,709,187	3,709,591	3,710,243	3,709,572		3,708,845
3,710,328	3,709,192	3,709,615	3,710,244	3,709,573		3,708,854
5 : 3,709,159	3,709,197	3,709,619	3,710,246	3,709,574		3,708,887
3,709,272	3,709,203	3,709,624	3,710,249	3,709,575		3,708,896
6 : 3,708,801	3,709,214	3,709,641	3,710,257	3,709,602		3,708,899
3,708,803	3,709,218	3,709,652	3,710,261	3,709,639		3,708,909
3,708,806	3,709,219	3,709,665	3,710,276	3,709,696		3,708,910
3,708,838	3,709,220	3,709,680	3,710,281	3,709,701		3,708,913
3,708,852	3,709,224	3,709,700	3,710,305	3,709,708		3,708,920
3,708,859	3,709,228	3,709,733	3,710,306	3,709,843		3,708,952
3,708,866	3,709,241	3,709,740	3,710,313	3,709,867		3,708,954
3,708,869	3,709,242	3,709,748	3,710,317	3,709,966		3,708,993
3,708,871	3,709,247	3,709,766	3,710,325	3,709,992		3,708,996
3,708,874	3,709,251	3,709,814	3,710,330	3,710,160		3,709,012
3,708,882	3,709,254	3,709,861	3,710,344	3,710,175		3,709,039
3,708,886	3,709,261	3,709,874	3,710,353	3,710,224		3,709,046
3,708,893	3,709,278	3,709,914	3,710,357	3,710,370		3,709,062
3,708,897	3,709,284	3,709,915	3,710,358	10 : 3,709,684		3,709,065
3,708,902	3,709,291	3,709,919	3,710,361	3,709,758		3,709,075
3,708,907	3,709,296	3,709,920	3,710,384	3,709,866		3,709,100
3,708,908	3,709,300	3,709,959	3,710,387	3,709,900		3,709,156
3,708,917	3,709,302	3,709,982	3,710,390	3,709,924		3,709,163
3,708,918	3,709,313	3,710,003	8 : 3,708,809	11 : 3,709,360		3,709,169
3,708,930	3,709,314	3,710,004	3,709,081	12 : 3,708,895		3,709,170
3,708,933	3,709,338	3,710,022	3,709,359	3,709,178		3,709,202
3,708,938	3,709,352	3,710,023	3,709,416	3,709,195		3,709,208
3,708,948	3,709,373	3,710,045	3,709,429	3,709,447		3,709,223
3,708,949	3,709,374	3,710,046	3,709,501	3,709,553		3,709,231
3,708,957	3,709,380	3,710,063	3,709,809	3,709,629		3,709,238
3,708,983	3,709,396	3,710,065	3,709,974	3,709,642		3,709,256
3,708,984	3,709,404	3,710,072	3,710,011	3,709,694		3,709,259
3,708,990	3,709,407	3,710,081	3,710,209	3,709,792		3,709,367
3,708,991	3,709,422	3,710,082	3,710,338	3,710,032		3,709,371
3,708,995	3,709,424	3,710,085	9 : 3,708,879	3,710,033		3,709,410
3,709,016	3,709,425	3,710,086	3,708,881	3,710,052		3,709,431
3,709,024	3,709,428	3,710,094	3,708,943	3,710,258		3,709,437

3,709,445
3,709,463
3,709,489
3,709,493
3,709,494
3,709,497
3,709,544
3,709,545
3,709,548
3,709,551
3,709,598
3,709,604
3,709,625
3,709,631
3,709,647
3,709,653
3,709,659
3,709,660
3,709,676
3,709,699
3,709,703
3,709,756
3,709,788
3,709,790
3,709,803
3,709,937
3,709,947
3,709,983
3,709,985
3,710,007
3,710,009
3,710,028
3,710,034
3,710,055
3,710,060
3,710,090
3,710,192
3,710,233
3,710,237
3,710,238
3,710,312
3,710,320
3,710,337
3,710,340
3,710,354
3,710,368
3,710,383
18 : Re.27,543
3,708,856
3,708,877
3,708,916
3,708,926
3,708,997
3,708,999
3,709,064
3,709,152
3,709,157
3,709,164
3,709,165
3,709,216
3,709,236
3,709,322
3,709,339
3,709,376
3,709,413
3,709,448
3,709,457
3,709,531
3,709,612
3,709,632
3,709,633
3,709,930
3,709,931
3,709,955
3,709,968
3,710,008
3,710,042
3,710,043
3,710,262
3,710,385
19 : 3,709,162
3,709,368
3,709,662
3,710,138
20 : 3,708,934
3,709,193
3,709,323
3,709,363
3,709,393
3,709,855
21 : 3,709,059
3,709,101
3,709,743
3,710,079
3,710,144
3,710,308
22 : 3,709,005
3,709,298
3,709,435
3,709,569
3,709,679
3,709,950
3,710,314
23 : 3,709,403
24 : 3,709,087
3,709,094
3,709,098
3,709,148
3,709,179
3,709,199
3,709,502
3,709,657
3,709,989
3,710,083
3,710,121
3,710,129
3,710,280
3,710,287
3,710,310
3,710,377
25 : 3,708,833
3,708,923
3,708,936
3,708,950
3,708,971
3,708,979
3,709,022
3,709,042
3,709,122
3,709,130
3,709,131
3,709,132
3,709,177
3,709,229
3,709,355
3,709,385
3,709,395
3,709,418
3,709,498
3,709,499
3,709,582
3,709,588
3,709,597
3,709,608
3,709,621
3,709,687
3,709,693
3,709,722
3,709,734
3,709,752
3,709,755
3,709,765
3,709,799
3,709,808
3,710,039
3,710,145
3,710,149
3,710,151
3,710,174
3,710,199
3,710,225
3,710,242
3,710,255
3,710,277
3,710,324
3,710,352
3,710,365
3,710,388
3,710,389
26 : Re.27,545
3,708,817
3,708,822
3,708,828
3,708,829
3,708,834
3,708,840
3,708,849
3,708,876
3,708,888
3,708,929
3,708,931
3,708,945
3,708,958
3,708,961
3,708,980
3,708,992
3,709,057
3,709,066
3,709,099
3,709,124
3,709,154
3,709,155
3,709,161
3,709,204
3,709,207
3,709,222
3,709,235
3,709,252
3,709,316
3,709,333
3,709,381
3,709,386
3,709,402
3,709,408
3,709,409
3,709,419
3,709,449
3,709,451
3,709,456
3,709,458
3,709,464
3,709,465
3,709,472
3,709,512
3,709,530
3,709,555
3,709,557
3,709,567
3,709,571
3,709,622
3,709,634
3,709,715
3,709,745
3,709,754
3,709,770
3,709,772
3,709,775
3,709,798
3,709,833
3,709,846
3,709,876
3,709,898
3,709,899
3,709,904
3,709,926
3,709,936
3,709,939
3,709,956
3,709,965
3,710,047
3,710,049
3,710,050
3,710,075
3,710,080
3,710,095
3,710,194
3,710,197
3,710,215
3,710,321
3,710,323
3,710,327
3,710,355
3,710,367
27 : 3,708,861
3,709,000
3,709,038
3,709,055
3,709,191
3,709,289
3,709,312
3,709,345
3,709,401
3,709,706
3,709,763
3,710,040
3,710,180
3,710,362
28 : 3,710,031
29 : 3,708,921
3,709,030
3,709,140
3,709,151
3,709,524
3,709,528
3,709,587
3,709,698
3,709,826
3,710,005
3,710,115
3,710,118
3,710,159
3,710,296
3,710,307
31 : 3,710,070
3,710,339
33 : 3,710,345
34 : 3,708,804
3,708,811
3,708,813
3,708,816
3,708,853
3,708,867
3,708,890
3,708,903
3,708,947
3,708,994
3,709,041
3,709,045
3,709,047
3,709,086
3,709,090
3,709,104
3,709,114
3,709,141
3,709,206
3,709,226
3,709,240
3,709,263
3,709,347
3,709,365
3,709,400
3,709,426
3,709,486
3,709,487
3,709,496
3,709,504
3,709,561
3,709,610
3,709,644
3,709,670
3,709,677
3,709,702
3,709,709
3,709,736
3,709,741
3,709,747
3,709,793
3,709,825
3,709,830
3,709,835
3,709,836
3,709,838
3,709,840
3,709,848
3,709,853
3,709,864
3,709,868
3,709,877
3,709,878
3,709,880
3,709,887
3,709,888
3,709,921
3,709,922
3,709,932
3,709,938
3,709,946
3,709,954
3,709,977
3,709,979
3,709,984
3,709,991
3,709,993
3,709,994
3,710,000
3,710,025
3,710,026
3,710,078
3,710,125
3,710,133
3,710,167
3,710,189
3,710,202
3,710,214
3,710,256
3,710,279
3,710,283
3,710,303
3,710,309
3,710,322
3,710,336
3,710,356
3,710,374
35 : 3,709,072
3,709,175
36 : Re.27,541
3,708,821
3,708,860
3,708,883
3,708,892
3,708,906
3,708,912
3,708,927
3,708,935
3,708,953
3,708,998
3,709,006
3,709,083
3,709,107
3,709,108
3,709,113
3,709,117
3,709,121
3,709,125
3,709,126
3,709,128
3,709,143
3,709,149
3,709,166
3,709,167
3,709,221
3,709,225
3,709,245
3,709,249
3,709,266
3,709,273
3,709,287
3,709,301
3,709,318
3,709,319
3,709,325
3,709,342
3,709,351
3,709,378
3,709,417
3,709,436
3,709,439
3,709,455
3,709,461
3,709,485
3,709,492
3,709,500
3,709,532
3,709,540
3,709,559
3,709,570
3,709,581
3,709,585
3,709,586
3,709,590
3,709,595
3,709,596
3,709,626
3,709,636
3,709,669
3,709,683
3,709,686
3,709,690
3,709,713
3,709,714
3,709,717
3,709,719
3,709,727
3,709,738
3,709,742
3,709,746
3,709,753
3,709,757
3,709,769
3,709,774
3,709,791
3,709,810
3,709,811
3,709,812
3,709,817
3,709,828
3,709,863
3,709,883
3,709,884
3,709,933
3,709,944
3,709,988
3,710,010
3,710,012
3,710,015
3,710,037
3,710,054
3,710,058
3,710,061
3,710,062
3,710,076
3,710,087
3,710,108
3,710,111
3,710,113
3,710,134
3,710,135
3,710,139
3,710,161
3,710,164
3,710,171
3,710,172
3,710,176
3,710,187
3,710,193
3,710,207
3,710,267
3,710,268
3,710,274
3,710,295
3,710,319
3,710,346
3,710,371
3,710,381
3,710,386
37 : 3,708,970
3,709,084
3,709,279
3,709,658
3,709,890
3,710,245
39 : 3,708,864
3,708,880
3,708,894
3,708,977
3,709,063
3,709,076
3,709,078
3,709,106
3,709,115
3,709,144
3,709,201
3,709,211
3,709,212
3,709,305
3,709,309
3,709,327
3,709,369
3,709,377
3,709,382
3,709,415
3,709,420
3,709,432
3,709,433
3,709,440
3,709,480
3,709,482
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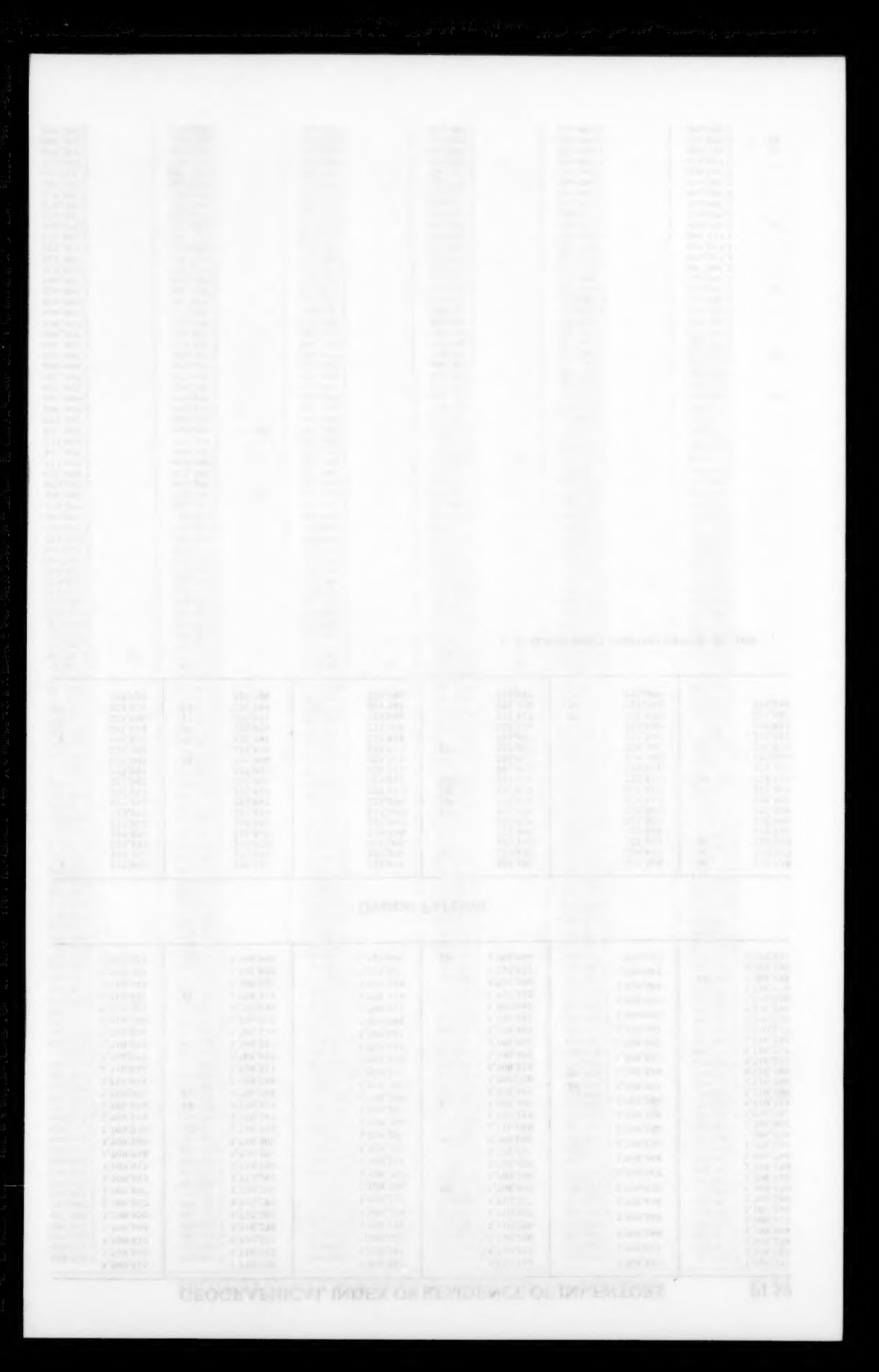

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Peter G. Peterson, Secretary

PATENT OFFICE
Sidney Goldstein, Commissioner